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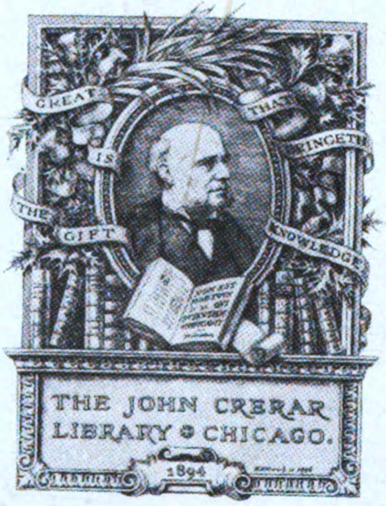

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Vol. 11 NEW YORK—JUNE 17, 1905—CHICAGO Number 24
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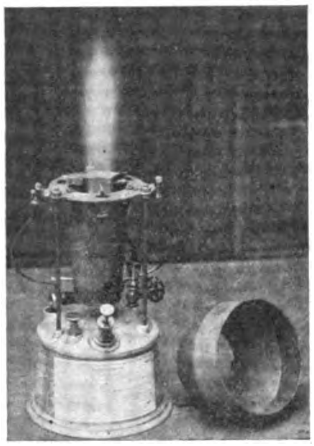

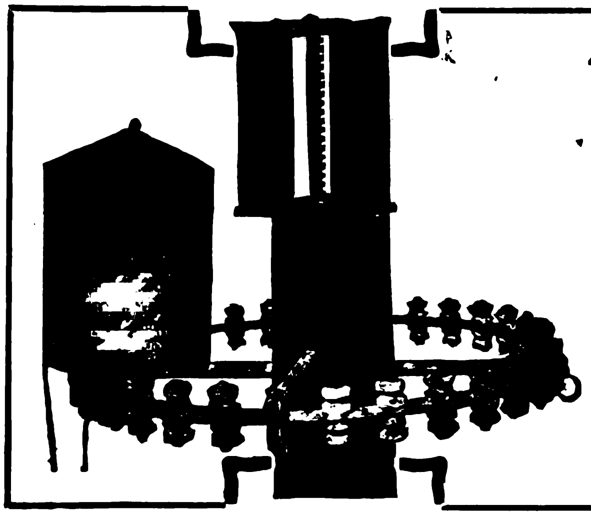

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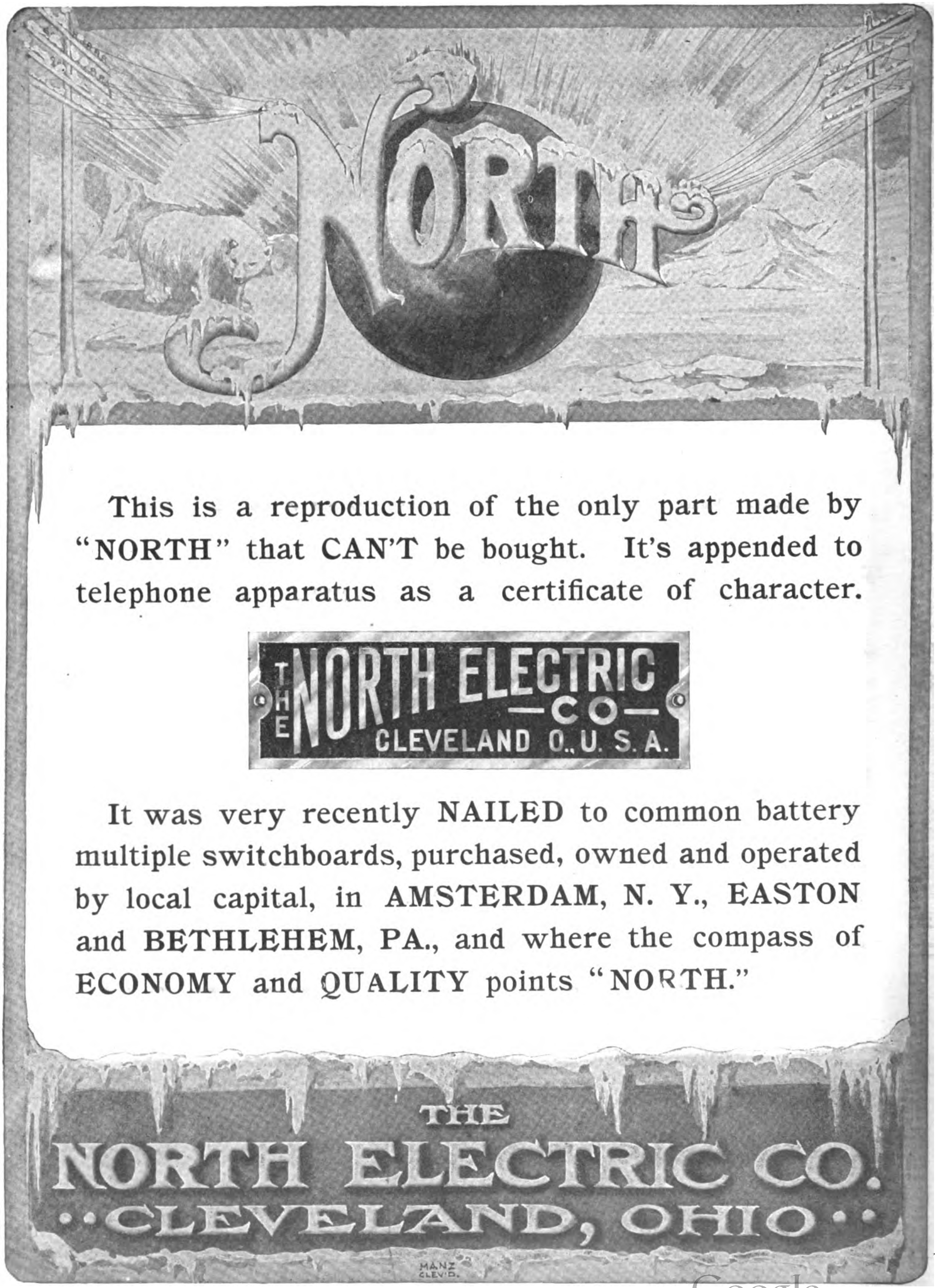
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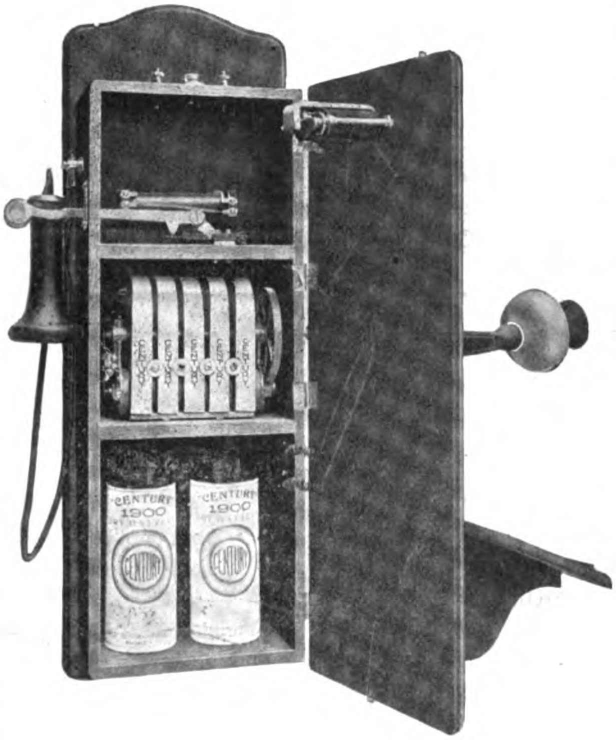

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FOR THE PURPOSE OF DEMONSTRATING THE
AUTOMATIC TELEPHONE SYSTEM

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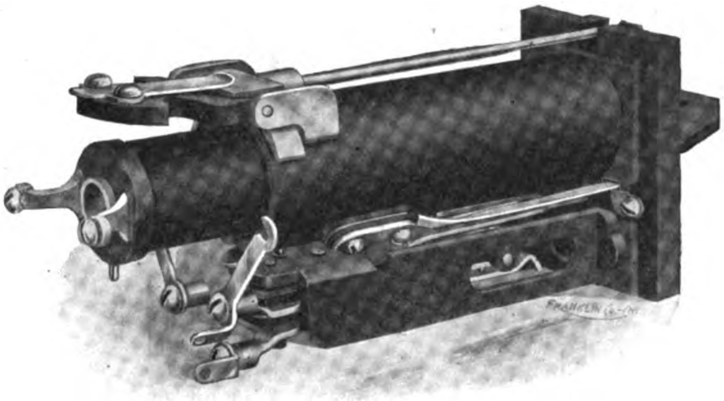
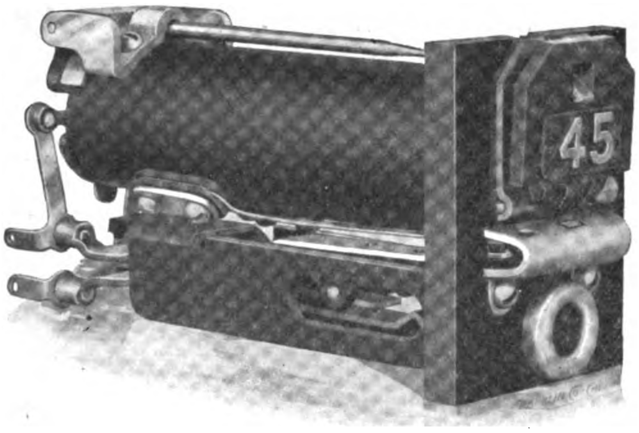


OUR new combined drop and jack is of the mechanically self-restoring type, having many novel and valuable features which are in keeping with other Dean apparatus.

The drop is of the large tubular type, having *more turns* of larger wire than other drops of this kind now on the market. This means *higher impedence,* less liability to break down of the winding and a more sensitive and *powerful action.*

The winding is removed without the use of special tools. Simply loosen the terminal screws and move the hasps to the other side and swing up the armature. The spool can then be released and withdrawn, the core remaining in the shell, *it being riveted there.*

The entire magnetic circuit is thus *left intact,* also the adjustment of the drop mechanism is *not disturbed.* This means that the windings are absolutely interchangeable and that any one can do the changing in a few moments without the least possible chance to go wrong.



The night alarm contact is direct acting. A long flexible German silver spring, shown at the side of the drop tube, serves as a contact closer. The contacts themselves are *platinum* and are located in front of the mounting strip behind a guard. *They can be seen;* their action is positive and all extra appliances such as night alarm relays and battery are done away with.

The jack is made with a rigid steel frame. It is removable, has *platinum contacts* to cut off the drop winding and a *positive stop* for the springs to rest on when in their normal positions. The latter construction allows a heavy initial tension to be maintained and absolutely prevents the plug from being stopped by coming into contact with the ends of the springs when inserted in the jack. The shutter restoring device is also direct acting and is protected by a guard.

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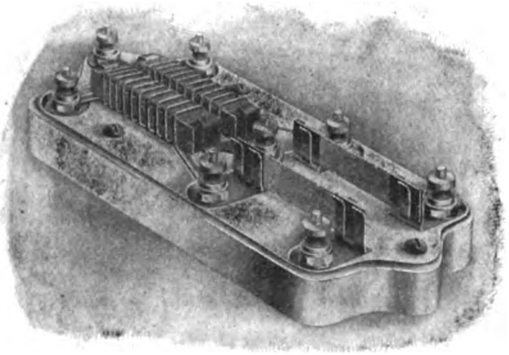

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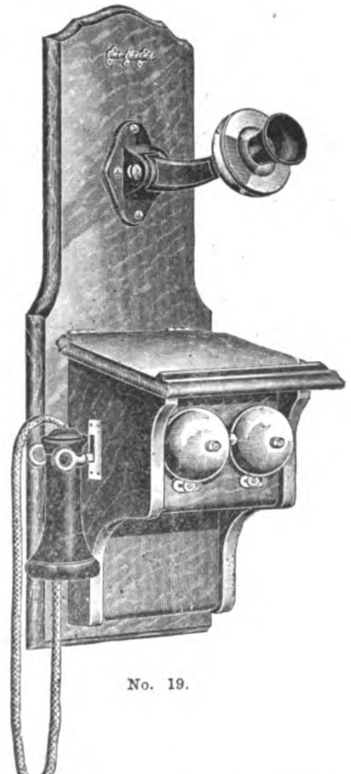

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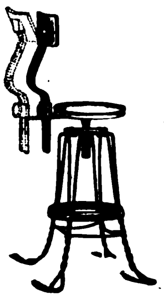

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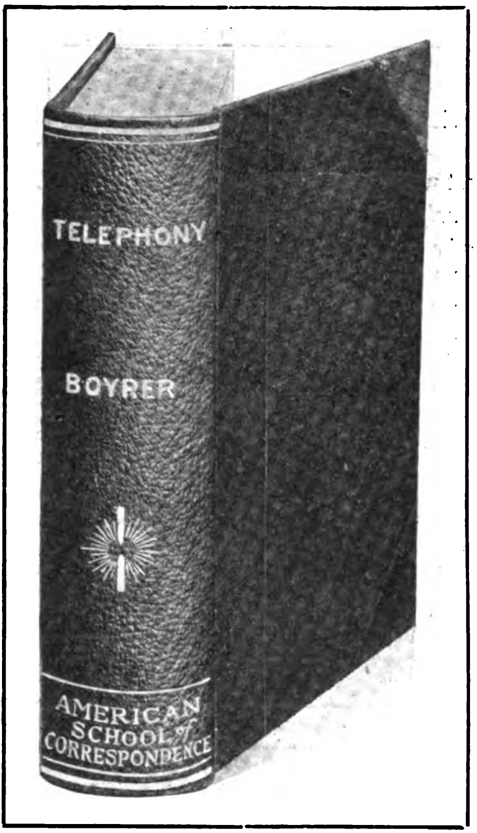

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PART II.—Theory of Dynamo-Electric Machinery—Design and Construction of Dynamos and Motors—Types of Machines—Motors in Machine Shops—Storage Batteries, Including Theory, Management and Types.

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PART IV.—Theory of Alternating Currents—Construction, Types and Operation of Alternators, Transformers, Induction Motors, Synchronous Motors and Rotary Converters—Power Transmission—Hewitt Mercury Vapor Converter.

PART V.—The Telephone—Lines—Circuits—Distribution—Line Construction—Distributing Points—Submarine Cable Lines—Cross Talk—Pupin's Load Coils—Telephone Exchanges—Switch Boards—Exchange Wiring—Operation and Maintenance—Systems—Local Calls—Trunk Calls—Toll Boards and Lines—Long Distance Switch Boards—Direct and Party Lines—Code Signaling—B. W. C. System—Private Branch Exchanges—Common Battery System—Testing and Clearing Trouble—Wire Chief's Desk—Testing Circuits and Apparatus—Testing New Cable—Cutting into Service—Locating Faults—Replacing Defective Sections—Automatic Telephone—Wireless Telephony.

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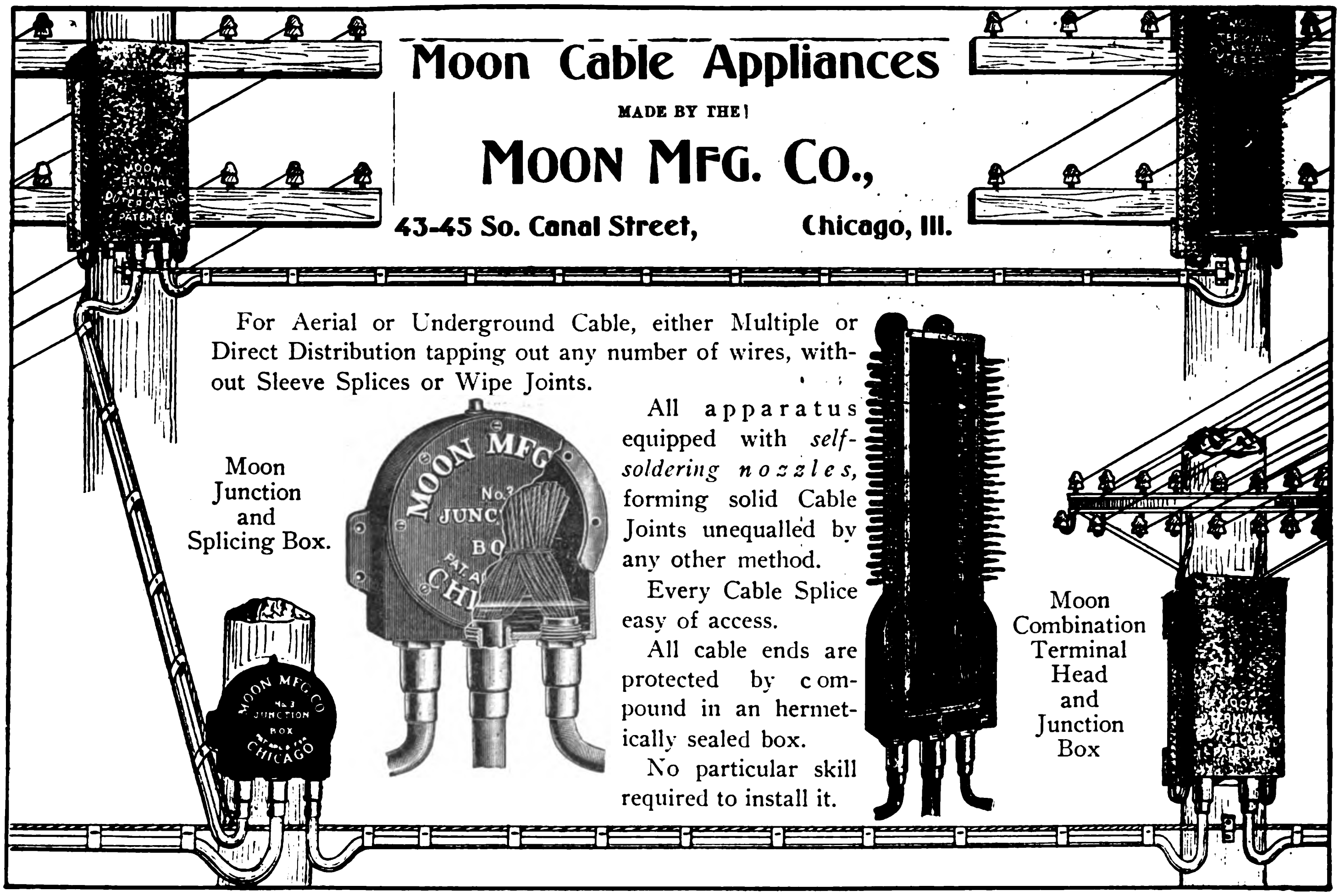

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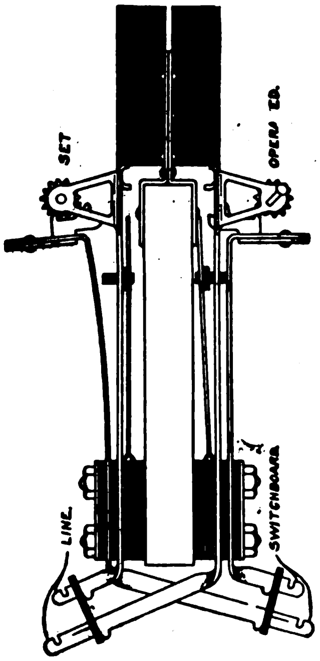

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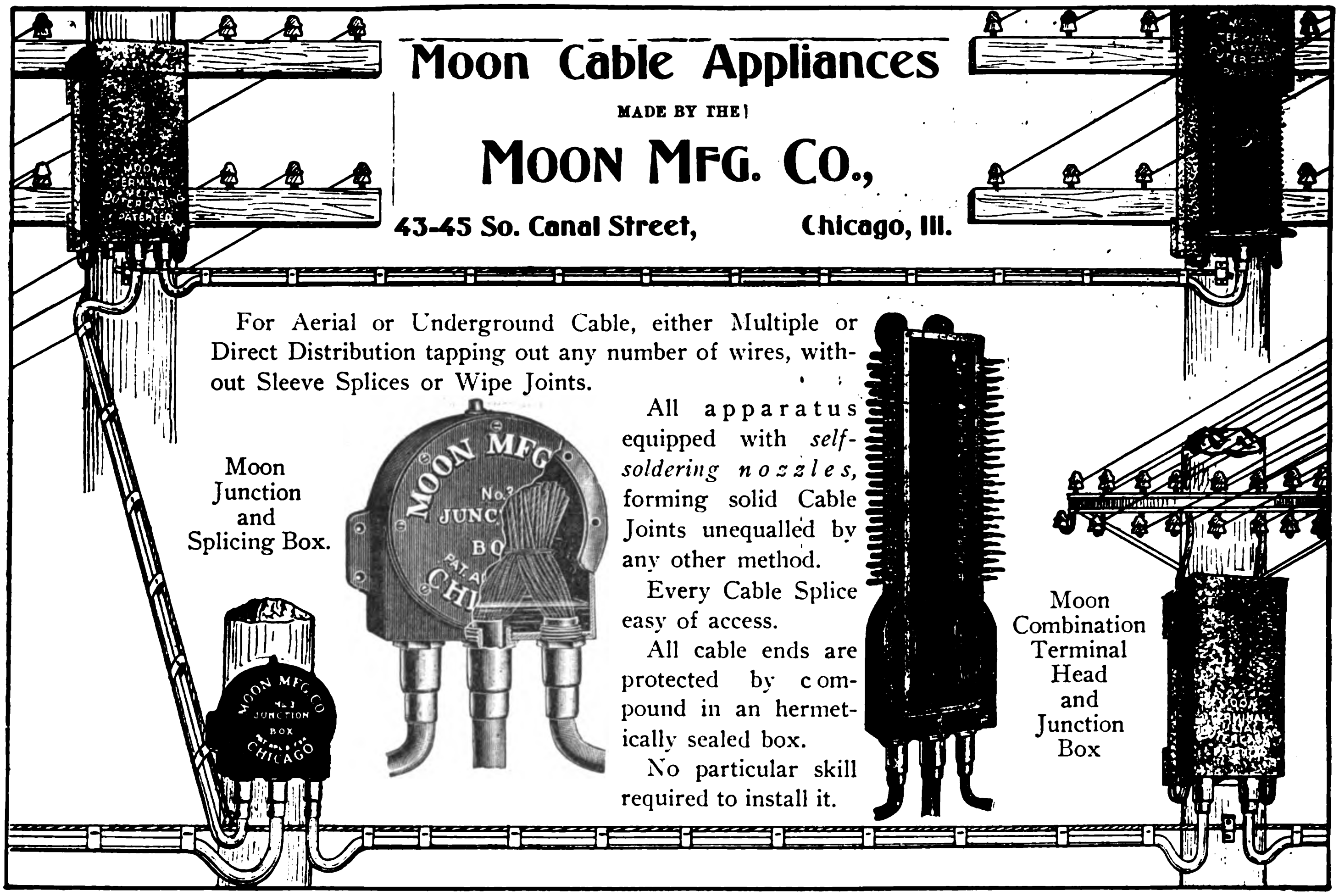
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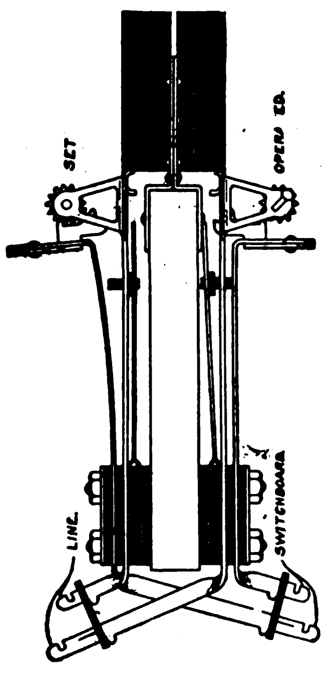

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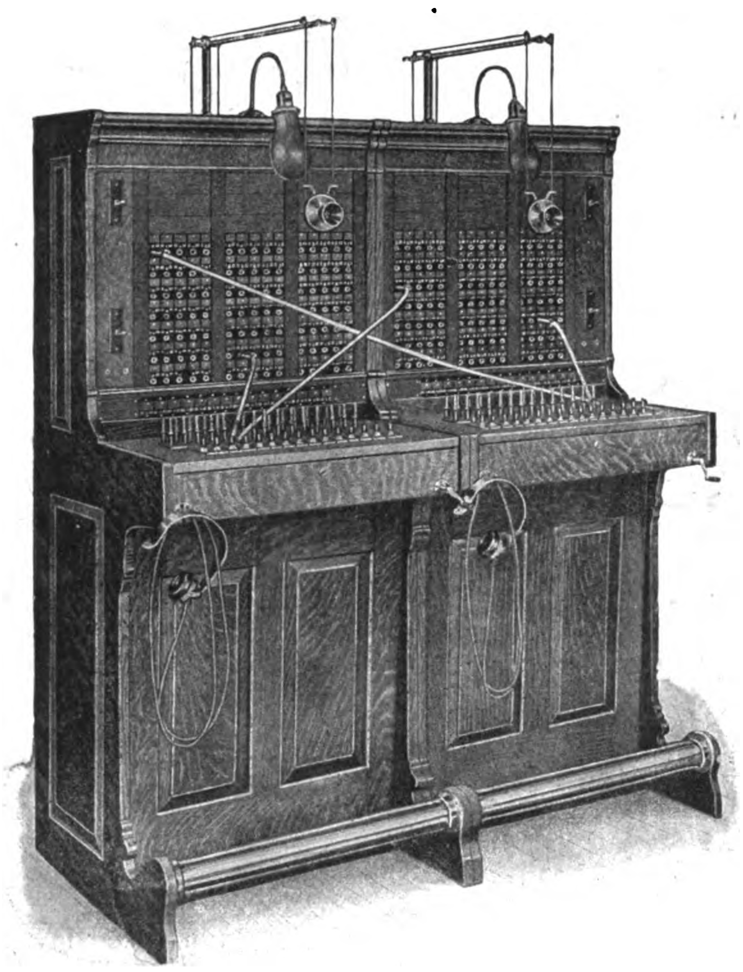

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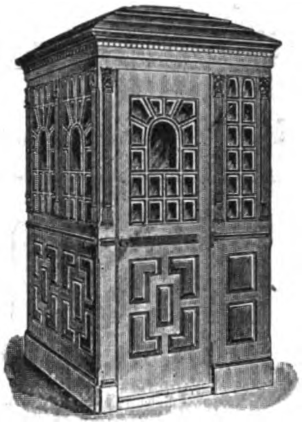

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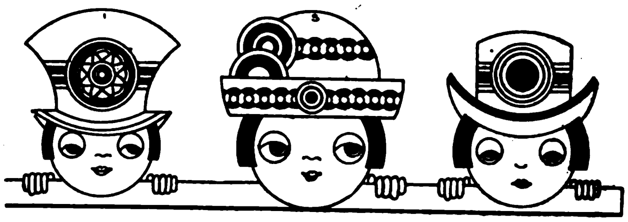

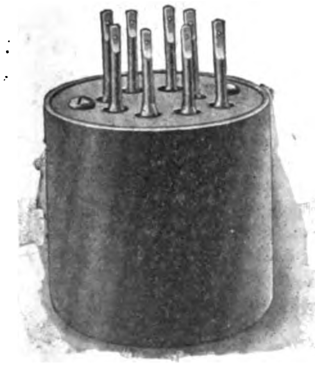

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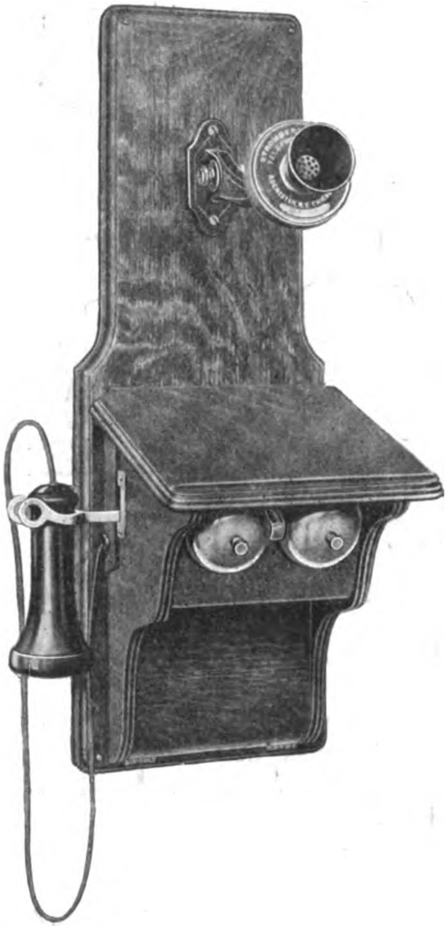

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When we say superior quality we mean Stromberg-Carlson Telephone apparatus is made absolutely perfect in finish, perfect in workmanship, and close attention to every detail in manufacture.

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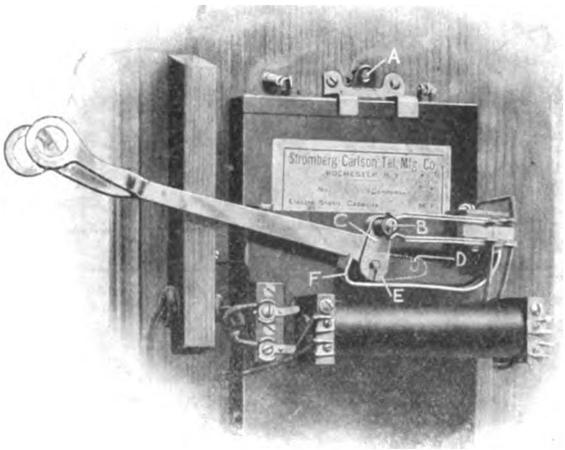
Did you ever see a telephone as simple? There's only two parts to the cabinet. Our transmitter and receiver, of course, need no introduction and it's sufficient to state that the other parts in the telephone are just as good.



The hookswitch can be easily removed if desired. The illustration, Fig. 1, shows this in detail.

A new bulletin on Central Energy telephones will soon be ready for distribution.

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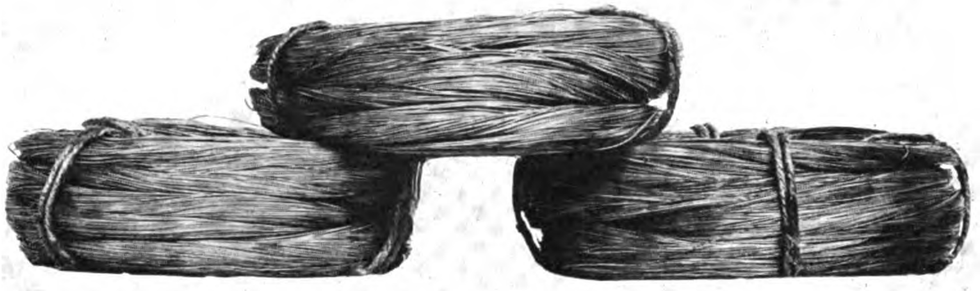

YOU can't expect to get the best talking results from cable lines unless you get the best wire. *The wire* used in the manufacture of Stromberg-Carlson Cable is commercially pure copper with special attention given to its annealing.

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The conductivity must be at least 98 per cent. of that of pure soft drawn copper as determined by Mathussen's standard, although the average of all the wire we use is between 99.5 per cent. and 100 per cent. and is very uniform.

The diameter of the wire must be true to gauge, variations allowable being less than .0004 inch.

All wire is handled with the greatest care possible in order to prevent any mechanical injury to the surface of the wire as slight scratches materially decrease its breaking strength.

The manner of splicing the wires used in cable is an important consideration. All of our factory splices are made by brazing the wires with *pure silver solder*, by experienced brazers. This insures a joint that does not increase the resistance of the conductors. It has a greater breaking strength than the wire itself.

NOTE.—Next week we will tell about the paper we use for insulation.

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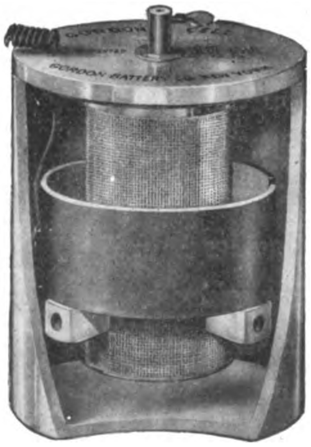

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VOLUME XI *SATURDAY, JUNE 17, 1905.* *NUMBER 24*

The National-Interstate Convention.

THE most important meeting of telephone men in the history of the industry will be held at the Auditorium Hotel, Chicago, on Tuesday, Wednesday and Thursday (June 20, 21 and 22). It will mark the formal coming together in one convention of the two national Independent telephone organizations that have been working more or less at cross purposes for several years. It will be the first real convention in the industry. The past conventions, both National and Interstate, have in reality been only informal meetings. No delegate plan was ever attempted, the attendance was unofficial, and membership depended only on the payment of small dues. At the forthcoming meeting all this will be changed. What is known as the "Ohio plan" will be inaugurated. That is, there will be a delegate system, such as prevails in other organizations, and an elective form will supplant the informal methods that have prevailed.

Jas. B. Hoge, Cleveland, Ohio.

The meeting will be under the temporary direction of James B. Hoge, president of the old National Association, and Theodore Gary, president of the old Interstate. They will be assisted in effecting the temporary organization by an executive committee, of which the members, besides Mr. Hoge and Mr. Gary, are Ed. L. Barber, Toledo, Ohio; Charles E. Hall, Salem, Ill.; J. D. Powers, Louisville, Ky.; J. G. Splane, Pittsburg, Pa.; Henry A. Barnhart. Rochester, Ind.; W. D. Barnard, Philadelphia, Pa.; L. L. C. Brooks, Minneapolis, Minn.; E. M. Coleman, Louisville, Ky. From present indications, Mr. Hoge, who has kept very closely in touch with the situation, expects that there will be an attendance of about 500 active Independent telephone men. A great deal of important work will be accomplished.

The movement which finds definite expression in the present convention had its inception in 1897. In April of that year a meeting of Independent telephone men was called in Chicago to organize for defensive work against the Bell. The meeting was attended by about 100 representative men. The late Judge Thomas was elected temporary chairman. The result of the meeting was a general call for a meeting to be held in Detroit on June 22 and 23. Over 400 operators and manufacturers responded and the National Telephone Associaton was organized. The next convention was held in Chicago in June, 1898, and thereafter every year the National Association met to discuss problems incident to its welfare. At the last convention of the National held at St. Louis on September 24, 1904, an organization committee was formed upon the motion of James B. Hoge, to perfect plans of organization along the lines of the Ohio Idea, which had been proven the most satisfactory. The following were the members: J. B. Hoge, Cleveland, chairman; C. W. Kline, Pennsylvania; H. Linton Reber, St. Louis; J. B. Earl, Waco, Texas; E. B. Fisher, Grand Rapids; Edward L. Barber, Toledo, Ohio, and Cyrus Huling, Columbus, Ohio. At the same meeting a new constitution was formulated which, among other features, stipulated the number of delegates to the annual meetings to be based upon a representation of one delegate for every 10,000 telephones, or 10,000 circuit miles of pole line. Delegates representing a lesser number of instruments or pole line mileage were to have only a part in proportion to amount they represent.

Theodore Gary, Macon, Missouri.

The Interstate Association was the outcome of a meeting of a number of Independent telephone men living in Illinois and adjacent States held in Chicago January 1, 1902. A notice was sent out for a convention to be held in Chicago April 9, 10, 11, when plans were formulated for the organization of the Interstate Telephone Association.

The association moved along till after the convention of the National at St. Louis in 1904, when overtures were made by the latter toward a consolidation. A joint conference between the officers of the two associations was held in Chicago on November 18, but nothing definite could be decided upon till the Interstate Association met on December 13, 14 and 15. At that convention it was definitely decided to join the National, and for that purpose a committee composed of Theodore Gary, L. L. C. Brooks, H. F. Barnhart, E. M. Coleman and C. E. Hall was appointed to arrange for consolidation. At this convention Theodore Gary was elected president and L. L. C. Brooks secretary.

The committee from the Interstate Association met the one from the National Association at Indianapolis January 21st and agreed upon a consolidation of interests, the new organization to be known as the National-Interstate Telephone Association. A constitution, embodying the principle features of both organizations, was unanimously adopted. This provided for organizing States and districts according to the Ohio plan.

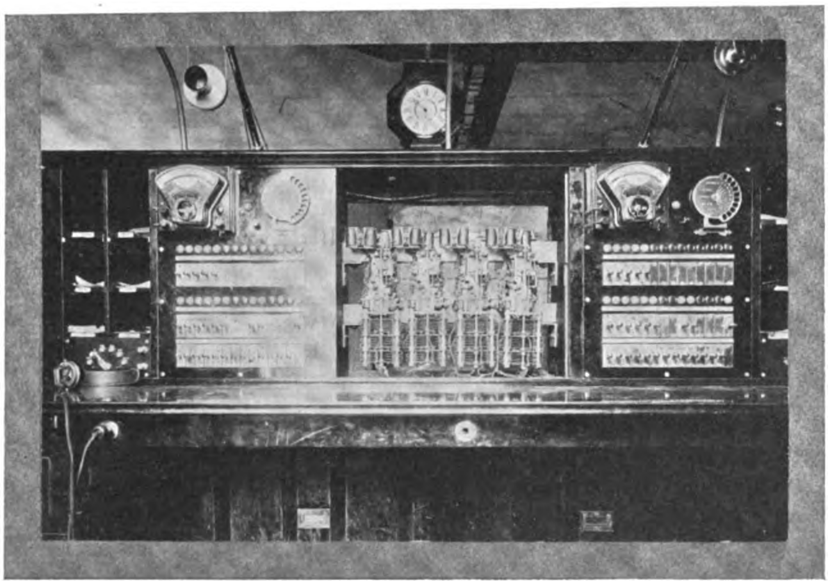
A Programme of the National-Interstate Convention will be found on page 408.

Los Angeles, The Telephone Marvel

By George G. Tonstead.

IN few other cities in the country is the telephone as commonly a public utility as in Los Angeles, California, where, with a population of 150,000, there are close to 35,000 telephones in use, including the Bell and the Independent. Until about four years ago the "Sunset" (Bell) Company had no competition. Then the Independent movement was inaugurated in Los Angeles, and the Home Telephone Company was organized by local capitalists. At the beginning this company purchased a Kellogg two-wire multiple board with an ultimate capacity of 18,000 lines, of which 7,049 were at once to be put into service. This board was at that time the very latest development in manual telephony and it was supposed that it would amply take care of the Independent telephone service in Los Angeles for some time to come. But the officers of the Home Telephone Company had anticipated incorrectly, for the subscription list began to grow so rapidly that within two years after the beginning of service it was nearly 10,000 lines and still growing. The demand for Independent service became so great that only the business district and a portion of the residence district in the south and west ends of the city could be accommodated by the equipment.

The Boyle Heights Automatic Telephone Exchange.



South Exchange Wire Chief's Desk.

About one year ago the Home company was obliged to increase its equipment still more, but it was faced by a very expensive proposition. When it is considered that for every new line added on its board the full multiple would have to be extended and the multiple for the new line carried throughout the board it will be seen that the cost of these extensions was rapidly growing almost prohibitive.

The local company decided to build a branch office in the south end of the city and thus relieve the main office of about 2,000 lines. The building had already been erected with a view of installing manual equipment, but after investigating the remarkably successful Automatic telephone systems built and installed by the Automatic Electric Company of Chicago at Grand Rapids., Michipans; Dayton, Ohio, and other cities, the officers of the Home company and their engineers decided the Automatic system was what they needed and adopted it.

The arrangement of the system in Los Angeles was, briefly, that the old or main office was to remain, for the time being, a manual office and was to serve directly only the business portion of the city, while branch exchanges equipped with the Automatic system were to be scattered over the city to give service to the residents in outlying portions of it, and these Automatic exchanges and the manual exchange downtown were to work smoothly in conjunction with one another.

Work was begun on this installation in May, 1904. At that time the order was placed with the Automatic Electric Company for the first of the Automatic branch exchanges, known as "South" for 4,000 lines. This was completed during the following July, and gave such excellent service that in August an order was placed for four additional branch exchanges; "Boyle's Heights" with 800 lines, "East" with 1,000 lines, "Vernon" with 400 lines (the latter being a sub-station of the branch "South"), and "Highland Park" with 400 lines, a sub-station of the branch "East." The following month a branch for "Prospect Park" with 100 lines was ordered, and last March the new branch exchange "West" with 3,000 lines was ordered. This is being built now and when it is completed "Prospect Park" will be made a sub-station of the "West" exchange.

Vernon Automatic Exchange.

With the completion of the "West" exchange, Los Angeles will have 9,700 Automatic telephones in service in connection with the manual exchange downtown, the latter so arranged that without interruption to the service it can eventually, if the company should desire, be transferred into an Automatic exchange, and make the entire equipment Automatic.

It may be of interest to telephone men to learn some of the details of the arrangement of this Los Angeles installation. By reference to the diagram accompanying this article it will be seen that the Home Telephone Company's system is arranged to cover the city as follows:

The "Main" office is located in the central business portion of town. It is the manual office and is designed to accommodate the business district. Its capacity for telephone numbers at present ranges from 1 to 18,000, of which about 9,000 are now in use.

The "South" branch exchange is designed to accommodate the numbers from 21,000 to 28,999, of which the numbers from 21,000 to 24,999 are at present in use.

"Vernon" is a sub-exchange of the branch "South" and it is designed to accommodate the numbers from 29,000 to 29,999, of which the numbers 29,000 to 29,399 are in use.

The "East" exchange is a branch in the eastern portion of the town and is designed to accommodate the numbers from 31,000 to 38,999, of which the numbers from 31,000 to 31,999 are in use.

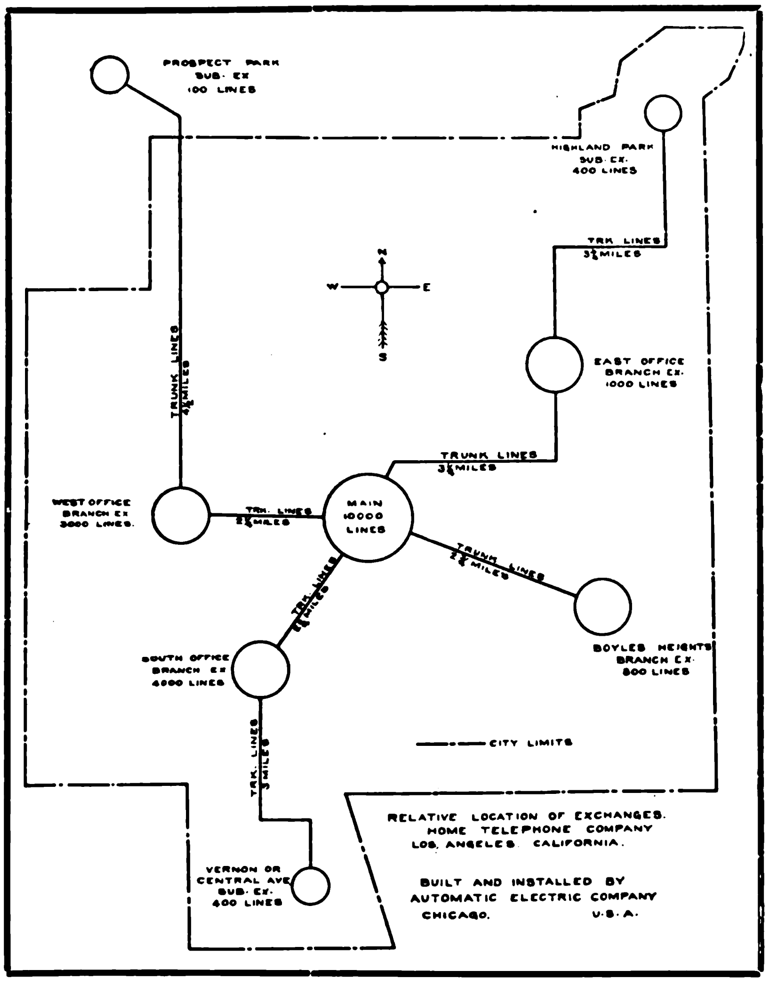
"Highland Park" is a sub-exchange of the branch "East" and is designed to accommodate the numbers from 39,000 to 39,999, of which the numbers 39,000 to 39,399 are in use.

"Boyle's Heights" is another branch exchange designed to accommodate the numbers from 41,000 to 41,999, of which the numbers from 41,000 to 41,799 are in use at the present writing.

"West" is a new branch exchange which is being built and is designed to accommodate the numbers from 51,000 to 58,999, of which the numbers from 51,000 to 53,999 will be used at the start.

"Prospect Park" is a sub-exchange of the branch "West" and is designed to accommodate the numbers from 59,000 to 59,999, of which the numbers from 59,000 to 59,099 are in use.

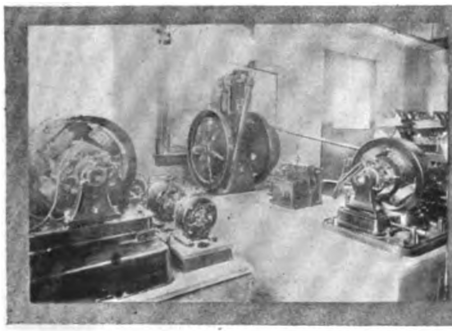
All of these exchanges, except the Main exchange, are Automatic. It will be seen from the diagram, which shows the distances between the various exchanges and the route of the trunk lines running between them, that calls from the Main office to any sub-exchange go through the branch exchange of which it is a "sub," and vice versa.


PROSPECT PARK SUB. EX 100 LINES
HIGHLAND PARK SUB. EX. 400 LINES
TRK. LINES 3½ MILES
N
W
E
S
TRUNK LINES 4½ MILES
EAST OFFICE BRANCH EX. 1000 LINES
TRUNK LINES 3½ MILES
WEST OFFICE BRANCH EX 3000 LINES.
TRK. LINES 2½ MILES
MAIN 10000 LINES
TRUNK LINES 2½ MILES
TRK. LINES 2½ MILES
BOYLES HEIGHTS BRANCH EX. 800 LINES
SOUTH OFFICE BRANCH EX 4000 LINES
TRK. LINES 3 MILES
CITY LIMITS
VERNON OR CENTRAL AVE. SUB. EX. 400 LINES
RELATIVE LOCATION OF EXCHANGES. HOME TELEPHONE COMPANY LOS. ANGELES CALIFORNIA.
BUILT AND INSTALLED BY AUTOMATIC ELECTRIC COMPANY CHICAGO. U.S.A.

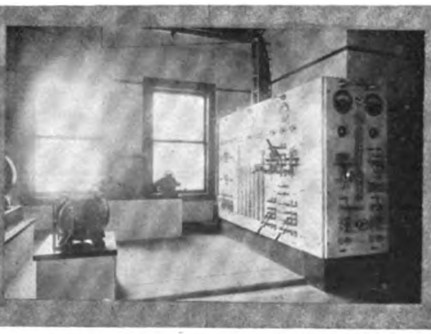
Central Office Layout
Of the Los Angeles Home Company.

The operation of the switches will not be explained here in detail since so much concerning it has been written lately. Only those points wherein the Los Angeles installations differ will be dwelt upon. First of all, this is a 100,000 system and requires five numbers for the calls. To operate a system of this size it is necessary to insert an additional switch, called a third selector, in the circuit. The first selector responds to the first movement of the dial and selects a trunk line to the corresponding sub-exchange. A subscriber, for instance, in the "South" office (the 20,000 exchange) calling 2 as the first move will select a trunk line in the "South" office; if he calls 3 he will select a trunk to the "East" office (the 30,000 exchange), or if he calls 4 he will select a trunk to Boyle's Heights" office (a 40,000 exchange). The second move of the dial actuates the second selector and picks out the thousand group in the exchange or its branch office. The third movement in like manner picks out the hundred. The fourth and fifth movements pick out respectively the tens and units on the connector switch. Suppose now a subscriber in the "South" office wishes to call No. 39,143, which is in the "Highland Park" office. The first movement of the dial operates the first selector in the "South" office and selects a trunk line to "East" office. The second movement is recorded in the "East" office and selects a trunk line to "Highland Park" office where the call is completed in the regular manner.

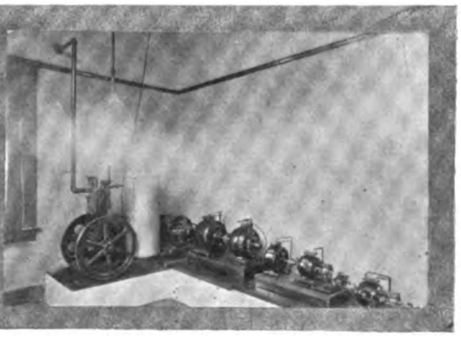
The Automatic equipment at the main office consists of a separate power plant and incoming and outgoing trunking positions. The power plant is installed to conform in appearance with the power plant previously installed for the manual board. For trunking there are eleven incoming trunk positions and four outgoing trunk positions, besides the trunk multiple which enables any trunk operator in the "Main" office to trunk a call into the "sub" office. When a manual subscriber wants to call an Automatic subscriber, say 24,325, which is in the "South" exchange, he removes the receiver from the hook and asks Central for the number. The operator goes in on the first "South" office order wire that is not busy and repeats the number to an operator at a switching section in the "South" office, who assigns a trunk line and puts up the connection and rings the subscriber. By this time the operator at the "Main" office has plugged into the assigned trunk and the subscribers are connected. Both operators have double supervision—that is, they can tell when either or both subscribers hang up their receivers. At the Automatic end, that is, in the "South" office, as has been stated, there are in addition to the automatic switchboards switching sections or manually operated boards which are used for handling trunk calls from "Main" only. The lines from all Automatic subscribers to the exchange are multiplied along the switching section, so that an operator in any position can reach any line on the board. There is a busy test so that when an Automatic line is in use, it cannot be called by an operator at another position or by another Automatic subscriber. These boards, which were also built by the Automatic Electric Company, represent all that is modern in the



Gas Engine
Motor Charging Sets.



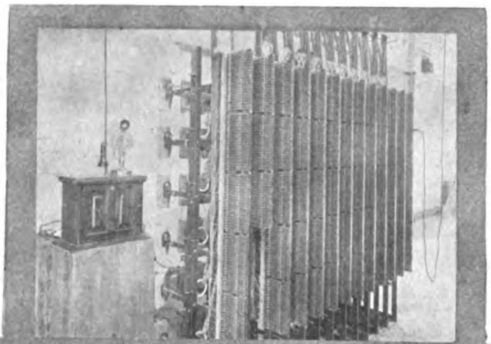
Power Plant
In Hill Street Exchange.

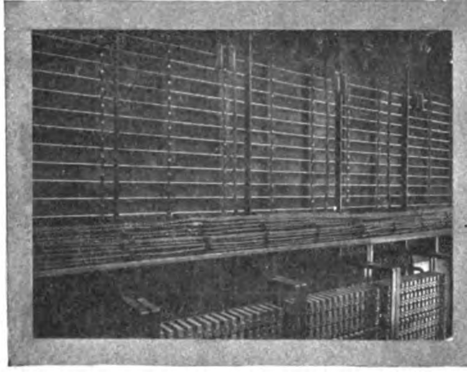


Gas Engine
Power Plant at Vernon.

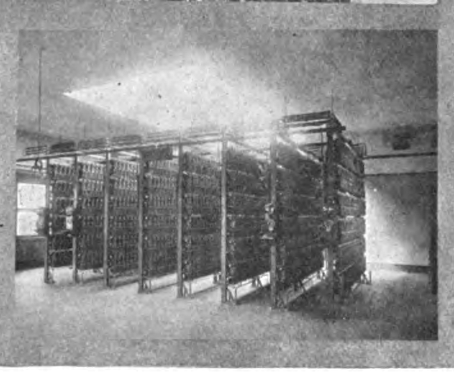
construction of manual boards. The cabinet work is solid mahogany and with the rich fittings presents an attractive appearance. At the "South" office there is a seven position board and at the "East" office and "Boyle's Heights" there are three position boards. All calls to "Highland" and "Vernon" from the manual office are at present handled automatically from the four outgoing positions at "Main" office, which are mentioned more fully later on.

East Los Angeles
Distributing Board and Protector.

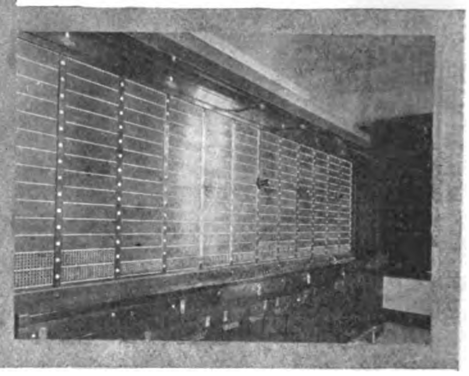




Back of
A Trunking Section.



East Los Angeles
Automatic Switchboard.



Front of
A Trunking Section.

Any Automatic subscriber wishing to call a number in the manual district pulls 1, which is marked "Main" on all dials, and presses the ringing button; this selects a trunk line to the "Main" office and signals the operator. The operator, throwing a key, puts out the signal light and connects herself with the Automatic subscriber. Then, ascertaining the number wanted, she plugs into the multiple and rings the subscriber. In plugging into the multiple, she lights the manual supervisory lamp which burns until the subscriber answers. When the subscribers hang up their receiver both the manual and the Automatic supervisory lamps light, which is a disconnect signal for the operator. All incoming trunks in the "Main" office end in cords and plugs, so that only one operation is necessary in plugging the connection. Each operator handles thirty trunks, to which six hundred Automatic subscribers have access. In the near future the Home company will install switches in the "Main" office which will enable the Automatic subscribers to call all numbers automatically, and the manual incoming trunks will no longer be necessary.

The outgoing Automatic trunk positions at "Main" office are used to call into the larger Automatic offices at night or such times when it would not be warrantable to have operators at the switching sections and are used to handle all calls from "Main" to "Prospect Park," "Vernon" and "Highland Park" offices. In the "Main" office there are order wires from every position to the four outgoing trunk operators. At the outgoing trunk positions the trunk lines to the different offices begin in jacks. There is also a trunking multiple at each position on the board which ends in cords and plugs at a trunk operator's position. Now, suppose a manual subscriber wants to call a subscriber, say No. 39225, which is in the "Highland Park" office. When he takes the receiver off the hook, the operator comes in and ascertains the number; she then goes in on the first order wire that is not busy and repeats the number to the trunk operator, who assigns the number of the trunk to be used. The trunk operator plugs into a trunk line to the "East" office and with a calling device calls 9225. We see that the first number of the call is omitted; this is because the operator performs the function of the first call, that of selecting a trunk line to the sub-exchange, when she plugs into the proper jack. Calling 9 operates a second selector in the "East" office and selects a trunk line to "Highland Park," where the call is completed in the regular manner. The Automatic supervisory lamp then lights and burns until the Automatic subscriber removes his receiver from the hook. When both subscribers hang up their receivers, both the subscribers' operator and the trunk operator receive the disconnect signal.

Of course, the subscribers of the Independent Company in Los Angeles are not acquainted with the steps taken in securing the connections when they make telephone calls. The manual subscribers know only that they must make their call orally through their telephone as they have been in the habit of doing, and that they secure their number, and Automatic subscribers understand equally as well that all numbers below 20,000 are called through the manual office, which is secured by pulling the finger hole 1 on the dial, also marked "Main," around to the stop and releasing, which enables them to give their order for manual numbers orally to the operator at the manual exchange.

The Automatic subscribers calling Automatic numbers merely make their call in the usual way in the Automatic telephone and do not know the exchanges it goes through, unless they happen to be more than usually familiar with the system.

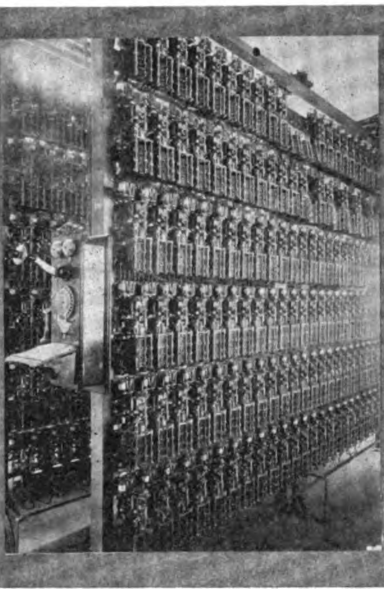
The directory of the Home Telephone Company makes plain to the users which are manual and which are Automatic numbers, and there is no confusion of them by the subscribers.

At the "South" office the equipment is complete for 4,000 lines. On the first floor are the superintendent's office, the operator's rest-room and a switching section room. Here also we find the distributing rack, power plant and wire chief's desk. The distributing rack was built by Frank B. Cook and is equipped on the switchboard side for 4,000 lines with the Cook self-soldering heat coils. There is a two-position wire chief's desk equipped to make all the necessary line and instrument tests. In the rear of

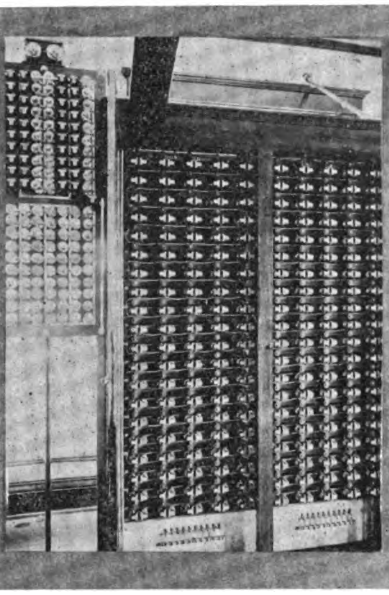
SOME PERTINENT STATISTICS RELATIVE TO INDEPENDENT DEVELOPMENT IN LOS ANGELES.

Population	150,000	*13 Independent telephones per 100 of population*	13 1-3
Total number of telephones	35,000	*No. of Independent telephones at start*	7,049
Telephones per 100 of population	23 1-3	*No. of Independent telephones at present*	20,000
One telephone to every four of population		*No. of Independent exchanges*	8

the room are the power board and machines. The power board is equipped with Crouse-Hinds switches and with Weston instruments of suitable range. The power board is compact and presents a neat appearance. There are two masonry piers, one for the charging set and ringing machines, the other for the gas engine set. These piers are finished with white glazed tile. The battery room is light and well ventilated. It contains duplicate sets of American batteries of 350 ampere hours capacity. On the second floor is the Automatic board. The equipment is arranged as customarily in sections of 1,000 and in units of 100. The four lower shelves of each unit throughout the exchange hold the individual switches, called first selectors. The top shelf is for second selectors and the next shelf is for third selectors and connectors. These switches are common to different groups and are symmetrically arranged so as to enable the attendant to quickly trace a call. There is suitable provision for increasing the number of these trunk switches at any time. On the top shelf there are switches placed at intervals. These are the trunk switches from the other Automatic offices.



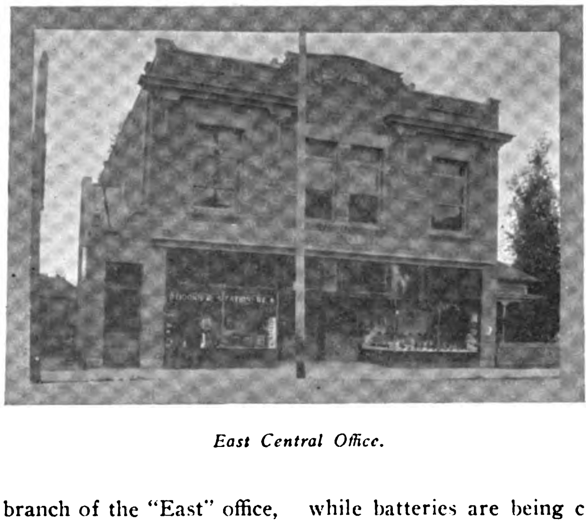
Automatic Telephone Switchboard.



Tell Tale Board in an Automatic Exchange.

The "Vernon" office is three miles south of the "South" office. "Vernon" is a sub of the "South" office; it is equipped complete for 400 lines with provision for increase. The power plant is in duplicate and consists of charging and ringing machines with a power board having suitable switches and instruments. The building is arranged to provide living rooms for the attendant. In an exchange of this size, there is very little work, and it is principally for the sake of safety that there is an attendant on hand to provide for any unexpected emergency that may occur.

The "East" office is a two-story building, especially designed for Automatic equipment. The first floor is rented out for a store, on the second floor is the Automatic board. It is equipped with switches for 1,000 lines. The power plant is in the rear of the building on the first floor, where there are two rooms, one for the batteries, the other for the charging machines and power board. The ringing machines are on a tile pier in the switch room. In the front part of the second floor is the switching section and operator's rest room. The switching section here is the same as at "South" office except that there are but three positions equipped. "Highland Park" office is a branch of the "East" office, and is an exact duplicate of the "Vernon" office in every detail. The "Boyle's Heights" office is installed complete for 800 lines. The power plant is in duplicate and consists of power-board, batteries and the necessary charging and ringing machines. There is a three position switching section here, a duplicate of the one at "East."



East Central Office.

"Prospect Park" office has an equipment of 100 lines. This office will be a branch of the "West" office when the latter is installed. The switchboard is installed in a residence, and the power plant is in a separate building in the rear. The power plant consists of a single battery with end cells and a gasoline engine-generator set for charging. The ringing is done with a small dynamotor which is automatically started when a call is sent in.

The power work in all exchanges is done in conformity with the underwriters' rules. The machine piers are all solid masonry, built from the ground, finished with white glazed tile. The storage batteries were all supplied by the American Battery Company. The arrester racks are all of the Frank B. Cook type, equipped with self-soldering heat coils. With the exception of "Main" office and "Prospect Park" office, all battery installations consist of duplicate sets of twenty-seven cells, each to furnish the customary fifty-four volts. The cells are placed on individual hard wood trays, mounted on porcelain knobs. There is also an individual battery test, that is, a lead is taken off each cell and ends in a jack on the power board. A plug is attached to the terminals of a low reading voltmeter. By plugging into the proper jack, the attendant can get the voltage of any cell.

The power boards are all of marble and equipped with Crouse-Hinds switches of ample carrying capacity. The power boards at "East" office and "Boyle's Heights" office are provided with fuses for the relay and transmitter circuits of the switching sections. The boards are all equipped with Weston standard switchboard voltmeters and ammeters of suitable range. The voltmeters are equipped with multi-circuit switches to enable the attendant to take readings of either charging set or either set of batteries. The ammeters are equipped with standard ammeter shunts and multi-circuit switches to read the charging current furnished by either machine or by the discharge currents on the boards. All power boards are equipped with I. T. E. overload and underload circuit breakers with the exception of "South" office, where a Ward-Leonard overload and underload circuit breaker is used. There is a tell-tale arrangement on the power board to indicate when any fuses are blown or if the circuit breaker operates while batteries are being charged.

From the preceding description there is one feature which will prove of interest to engineers, namely the distribution of the subscribers' lines amongst a number of several small exchanges instead of serving the city with one central office. As this is a phase of plant design which has been the subject of many discussions and as the pros and cons have both been championed by experts, the results of the future will be worth investigating.

An Efficient Home-Made Wagon Reel.

By M. S. Yoder.

Fig. 1 shows a photographic reproduction of the wire reels used by the Mutual Telephone Company, of Shipshewana, Indiana, which were designed by the writer. The company, after giving them severe usage, feels that they are about as handy for country line construction as any reel that can be made. The reel frames are made to fit the top of a wagon box so that room is left under them in the box for wire, line tools and supplies. In the picture one reel is raised from its normal position on the wagon box to better show the method of its construction. The man is holding a clamp (*E* in Fig. 2) in his hand.

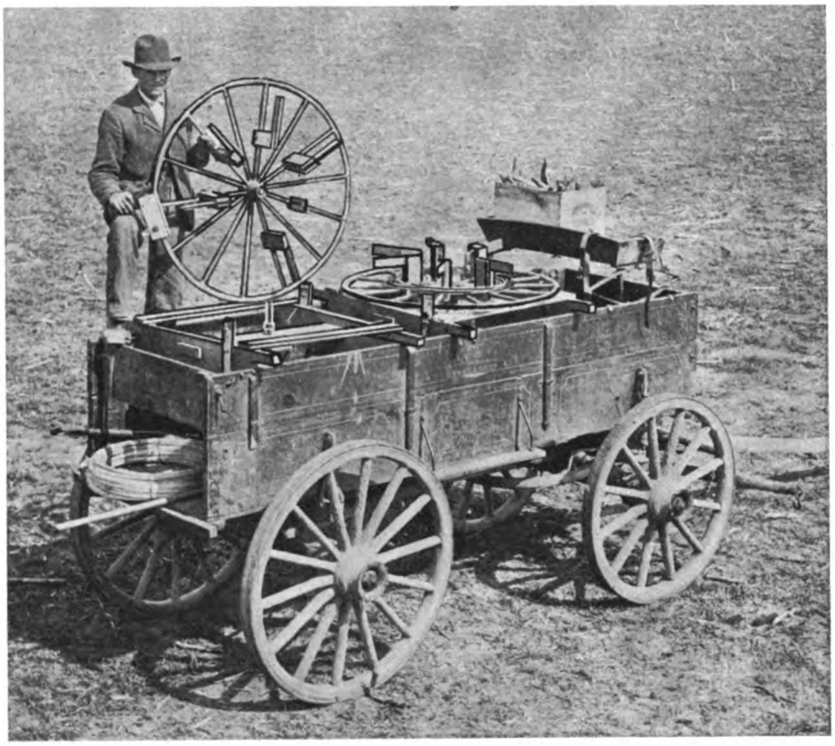


Fig. 1. Wagon Reels Used by the Mutual Telephone Company, of Shipshewana, Indiana.

When the wagon and reels are being used for ordinary work a team draws the outfit and a slight tension is put on the reel brakes (*F F*, Fig. 2) to prevent the wire from being paid off too rapidly and becoming kinked or tangled. For stationary use, where the wire is pulled off by hand, the reels may be used either on the wagon or on the ground. In this case the tension brake is removed entirely by taking off the thumb nut *G* (Fig. 2).

The wheels used in the construction of the appliance are taken from a worn out buggy. The stubs from its axles (*B*, Fig. 2) are cut off that they may be mounted in the frame of the reel, so that the wheels, which carry the coils of wires, may turn on them. Fig. 2 shows in detail the component parts. The figure is not drawn to scale as the stub clamp and brake are drawn large as compared with the frames and the reel. *A* is the old buggy wheel and *B* is the axle stub taken from the same buggy. *B* is fitted into holes in the centre of the frame *C*. At *D* the frame is shown inverted.

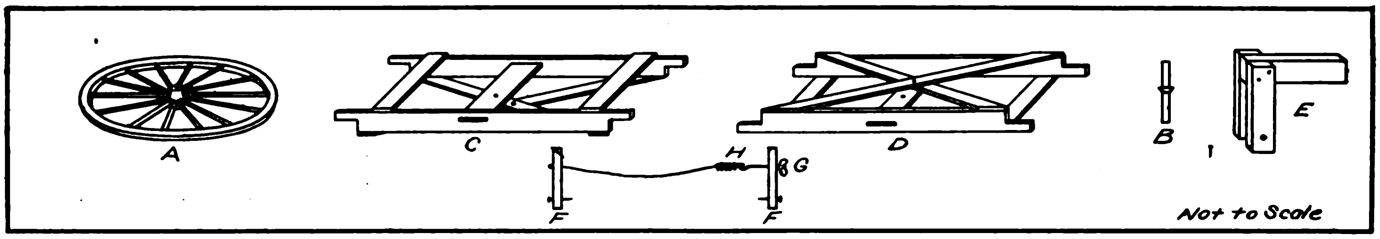


Fig. 2. Drawing Showing the Component Parts of the Home-made Wagon Reel.

Clamps *E* are gripped on every other spoke of the wheel to hold the coil of wire in position. These clamps are made of three pieces of wood, nailed together in the form of a letter L. A bolt is arranged near the lower end of each one, so that it may be clamped to the wheel's spoke. This bolt should come above the spoke of the wheel, so that the clamp may be handily removed without taking the bolt entirely out. The two side pieces of each clamp are grooved slightly, so that they will more firmly grip their spokes.

At the right of the diagram the brake is shown. Wooden brake shoes *F F* are fastened loosely on opposite sides of the frame in such position as to bear against the tire of the wheel, when pressure is applied by tightening the thumb nut *G*. The wire spring *H* is used in connecting the two brake shoes on each reel to furnish the necessary tension. The connecting wire passes under the main crossbar of the frame to be out of the way of the reel, so that it will offer no resistance to its revolving easily and freely.

ROME NOW TALKS WITH PARIS OVER NEW LONG DISTANCE LINE.

After many trials and failures the problem of connecting Paris city directly with Rome by telephone has been solved. Although the line had been projected several years ago, many obstacles were encountered, and it was due to the determination of purpose on both sides that they have all been surmounted, and that the line will be opened to general use within a few days. Angelini, chief of the Italian Telegraph and Telephone Department, who has worked indefatigably and has been the most enthusiastic of all interested in the accomplishment of the connection, at the completion of the line called up Gaston Calmette, chief editor of the Paris Figaro, thus having with him the first direct talk over the wire. He delivered a fraternal message from the members of the Italian press to their French colleagues, and after an exchange of compliments, Angelini invited Calmette to listen to some Italian music.

Fig. 1.
Insulating Machine.

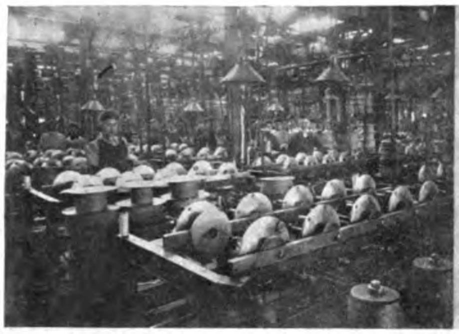


Fig. 2.
Core Making Machines.

Fig. 3.
Another View of Core Making Machines.

The Making of Telephone Cable

By J. S. McLean.

The photographs to illustrate this article were taken especially for The American Telephone Journal *at the new cable factory of the Stromberg-Carlson Telephone Manufacturing Company, Rochester, New York. Mr. McLean, the author of the article, is the superintendent of the Stromberg-Carlson Cable Department and one of the high authorities on the subject.*

FROM the time of its conception in Philadelphia, in 1881, the field for underground telephone cable has grown very rapidly, until to-day thousands of miles of it are in use. One of the first experimental cables was tried in Boston and was simply two parallel rubber covered wires. This construction gave such large electro static capacity and self-induction that one mile was the limit of a telephone connection. The self-induction was reduced by twisting the wires together, which increased the usefulness of the cable, but the electro static capacity was still so high that the amount of this type used was very limited. The cause of this condition was the high electro static capacity of the insulating medium. The next step was to find an insulating material which would give a low electro static capacity. This required many long and tedious experiments, and it was not until W. D. Sargent, of Brooklyn, tried dry paper that the various experimentors found the right track. It was not long after that T. D. Lockwood found that the low capacity depended not upon the insulating medium but upon the dry air included in the loosely wound paper. Thus the fundamental principle of the telephone cable was discovered and cannot be assigned to any one person. This principle is the standard to-day.

Even after the results obtained by the above experiments it was necessary to find some cheap and efficient means of protecting the dry paper insulated wires from moisture and mechanical injury. For this we are indebted to Mr. W. R. Patterson, who was making experiments on a device for sheathing the cable in lead and who evolved a hydraulic press for so doing which is still used in the standard method of manufacture. the above is a brief history of the development of telephone cable. The writer will now outline the modern methods of manufacture as used by the Stromberg-Carlson Telephone Manufacturing Company.

All manufactured articles depend for their excellence on the quality of the raw material and the care and skill with which this material is treated in passing through the various processes. Telephone cable is no exception to this rule. Therefore all raw material is bought under specifications which it must pass, the tests being made by the company's chemical and electrical experts. Great care is exercised in handling the raw material to prevent mechanical injury. This is especially true of bare copper wire, as a slight abrasion on its surface materially decreases its strength at that point. The conductors in the majority of cables are 19, 20 or 22 B. & S. copper wire, although other sizes are used according to the specifications of the customers. The wire is commercially pure, bright annealed copper, with a conductivity of at least 98 per cent of that of pure, soft-drawn copper, as determined by Matthiessen's standard, although the average conductivity of all wire used is between 99 and 100 per cent.

The first operation in making telephone cables is the insulating of the single conductors. This is done by horizontal machines (Fig. 1). The wire is fed from coils into the machines by special unreeling drums and passes through two heads set in line and revolving in opposite directions. Each of these winds one wrap of paper spirally on the wire, thus giving a double wind of paper, which is so arranged that at any point there are four thicknesses of paper between the wire and the outside of the insulation.

Great care is taken in joining the wires, all joints being brazed with pure silver solder by experienced braziers. This insures a joint which has a lower resistance and also a greater breaking strength than the wire itself. In insulating the wire

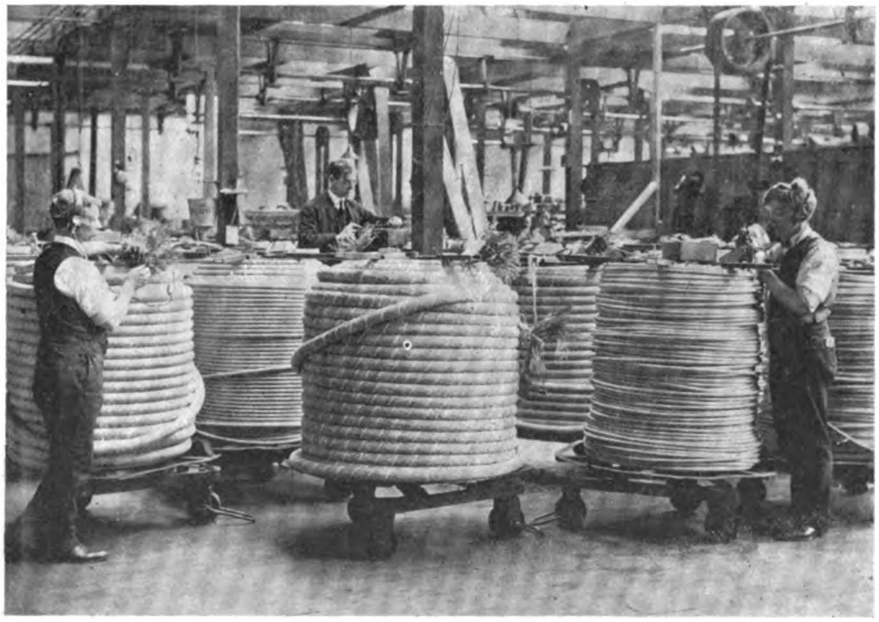


Fig. 4. Testing Cable Cores.

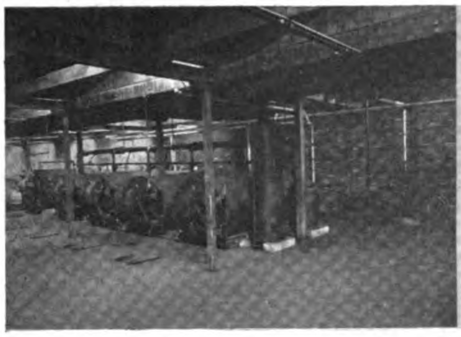


Fig. 5.
Drying Ovens.

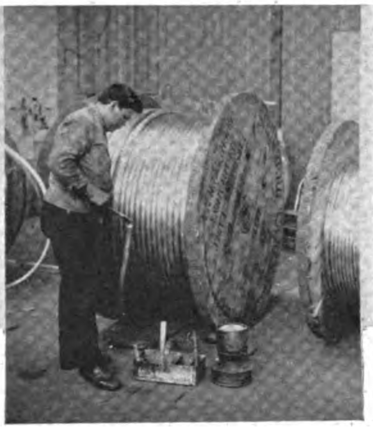


Fig. 9.
Sealing up the End of a Cable.

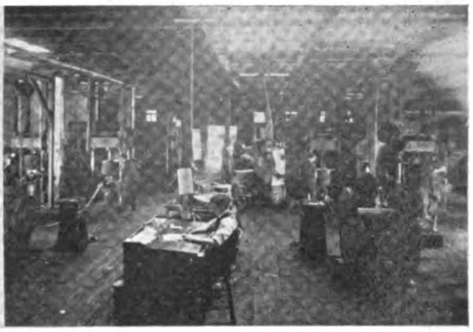


Fig. 6.
Lead Presses.

it is so arranged that one-half of the wire receives two wrappings of gray paper and the other half two wrappers of red paper. The reason for this is plainly seen in the next operation, which is to twist two wires together to form a pair. One gray wire is twisted with a red one, thus giving a distinctive color to each wire in the pair.

After the wires are twisted in pairs they are placed on the core machine (Figs. 2 and 3), where they are laid up so as to form the cable core. These machines consist of a series of drums on the periphery of which there is set a number of spindles such as will receive the spools of twisted wires. The pairs of wires on each drum are led through a mouthpiece in the forward end of the drum and into the rear of the drum immediately preceding it, and so on through the drums. These drums are revolved simultaneously but alternate ones revolve in the one direction and the intermediate ones revolve in the other. As each drum places one layer of pairs on the cable, we have at the end of the last drum a cable core which have alternate layers put on in the same direction and the intermediate layers in the opposite direction. This construction gives the desired non-inductive core. After the last layer is put on the core is wrapped with one layer of heavy manilla paper. This insures high insulation between the core and the sheath and also protects the pairs from mechanical injury.

When the cable core is made it is then tested for opens and crosses (Fig. 4). This is done by means of a head receiver and two dry cells. Each individual wire is tested. If there is a fault in the core it is located by electrical tests and the fault repaired.

The core is now ready to be dried. This is a very delicate process, requiring an experienced man in attendance night and day, and is the critical point in the manufacture of the cable, as both the high insulation and low capacity of the finished cable depend entirely upon it. The drying is done by means of ovens (Fig. 5), which are large iron chambers each capable of holding thousands of feet of cable core and closed by a heavy iron door. The temperature of the inside of the chambers is controlled by outside steam valves.

After the core has been placed in these ovens the doors are closed and the temperature of the air in the chambers raised. After the core has become sufficiently hot the vacuum pump is started and the air and moisture pumped out of the chamber. The pumping is continued until the cable core is perfectly dry, when the vacuum is broken by allowing perfectly dry air to pass into it and be absorbed by the cable core.

We are now ready to encase the core in its lead sheath. This is a very interesting process and depends for its success upon a peculiar physical property of lead. When lead is heated to within 75° or 100° F. of its melting point it will, if subjected to enormous pressure assume a plastic state and will become solid again as soon as the pressure is removed. Therefore if we put melted lead in the cylinder of a lead press (Fig. 6) and allow it to cool and then put enormous pressure upon it, it assumes a plastic state and is forced out around the cable core, and thus out of the press into atmosphere where the lead assumes a solid state and therefore forms a continuous sheath around the cable.

As the cable comes from the lead presses it is wound on the large wooden reels on which it is shipped, and after being allowed to cool to about 60° it is ready for its final inspection. This consists of tests for insulation and capacity of each individual wire by highly sensitive reflecting galvanometers operated by experienced men in a room carefully shielded from vibration (Fig. 7). The connections for each set of instruments being made by a man on the outside of the room (Fig. 8), communication between the men is made by telephone and by a telegraph sounder. These tests, both for insulation and capacity, are obtained by comparing the deflection received from the unknown cable with those obtained from a known and certified standard. This method gives accurate results, as deflections from the various standards are taken for every cable treated.

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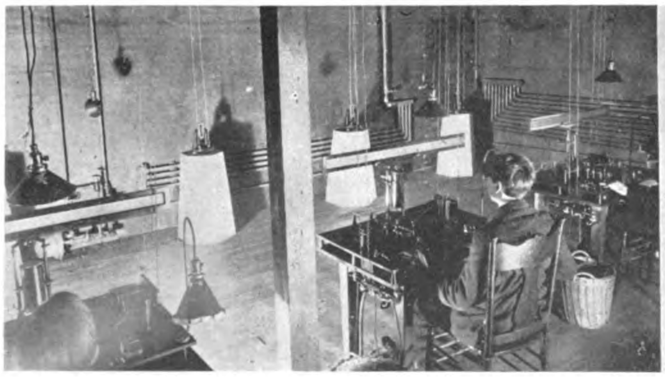
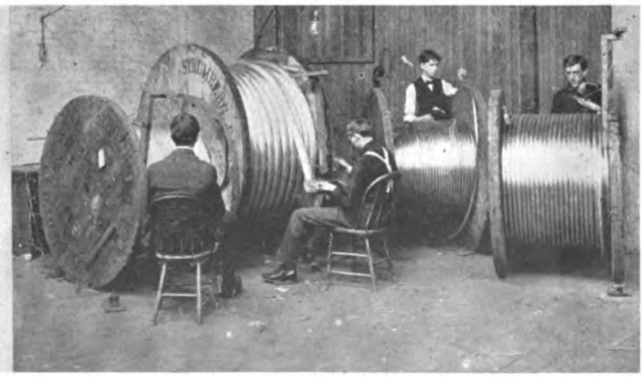


Fig. 7.
Testing—In the Laboratory.



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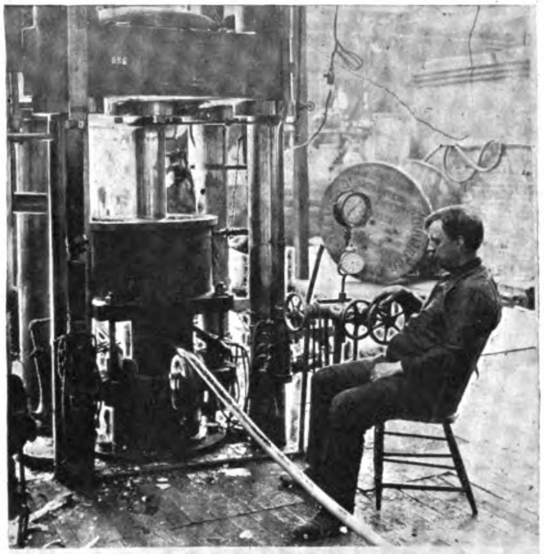

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Giving Paper the Chlorine Test.

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By A. S. Hillhouse

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The exercise of proper care in this respect will result in a compact yet flexible organization, each employee working for the common good of the company and not only willing, but anxious, to assist in performing any service that will help to raise the general standard of excellence. Efficient organization and system are two of the greatest factors of success in any business and apply with particular force to the management of telephone companies, as their business is essentially one of details.

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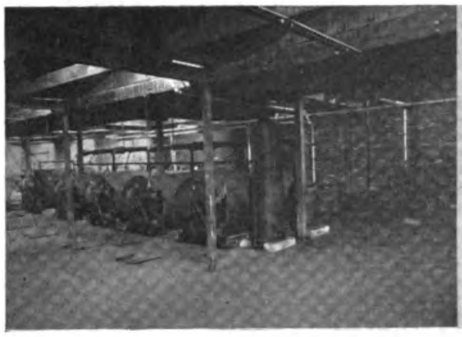
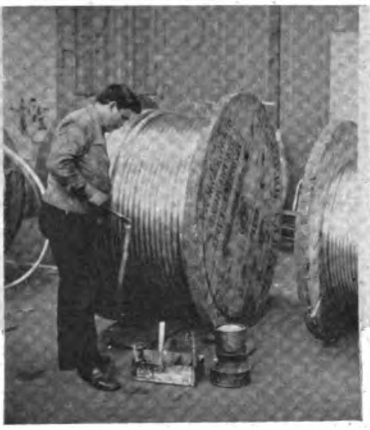


Fig. 5.
Drying Ovens.



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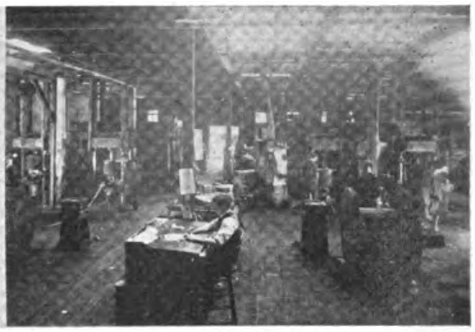

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After the wires are twisted in pairs they are placed on the core machine (Figs. 2 and 3), where they are laid up so as to form the cable core. These machines consist of a series of drums on the periphery of which there is set a number of spindles such as will receive the spools of twisted wires. The pairs of wires on each drum are led through a mouthpiece in the forward end of the drum and into the rear of the drum immediately preceding it, and so on through the drums. These drums are revolved simultaneously but alternate ones revolve in the one direction and the intermediate ones revolve in the other. As each drum places one layer of pairs on the cable, we have at the end of the last drum a cable core which have alternate layers put on in the same direction and the intermediate layers in the opposite direction. This construction gives the desired non-inductive core. After the last layer is put on the core is wrapped with one layer of heavy manilla paper. This insures high insulation between the core and the sheath and also protects the pairs from mechanical injury.

When the cable core is made it is then tested for opens and crosses (Fig. 4). This is done by means of a head receiver and two dry cells. Each individual wire is tested. If there is a fault in the core it is located by electrical tests and the fault repaired.

The core is now ready to be dried. This is a very delicate process, requiring an experienced man in attendance night and day, and is the critical point in the manufacture of the cable, as both the high insulation and low capacity of the finished cable depend entirely upon it. The drying is done by means of ovens (Fig. 5), which are large iron chambers each capable of holding thousands of feet of cable core and closed by a heavy iron door. The temperature of the inside of the chambers is controlled by outside steam valves.

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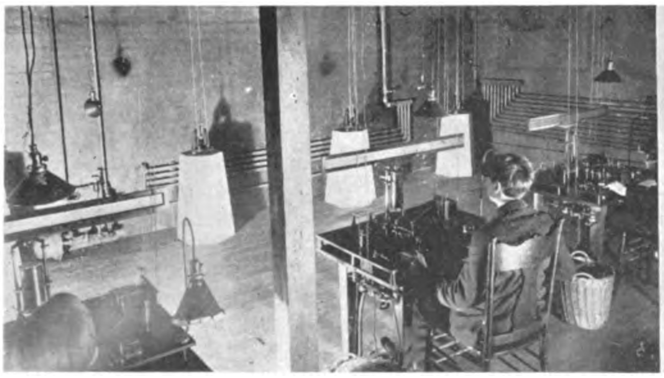

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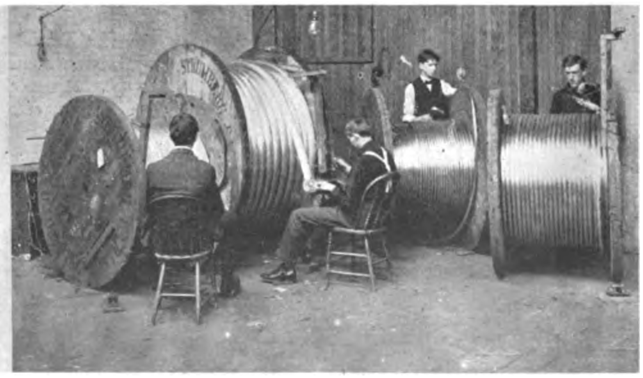

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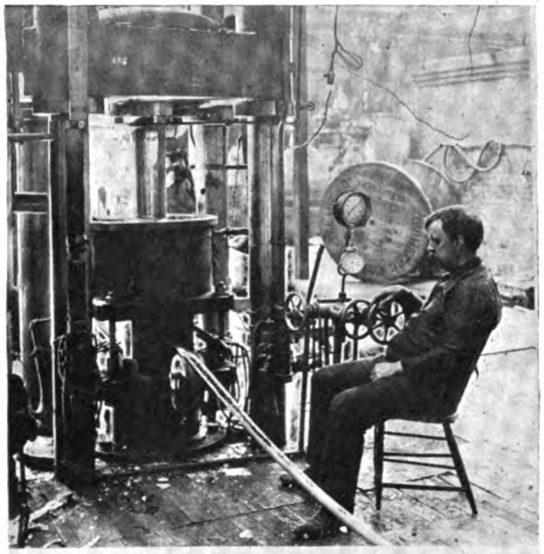

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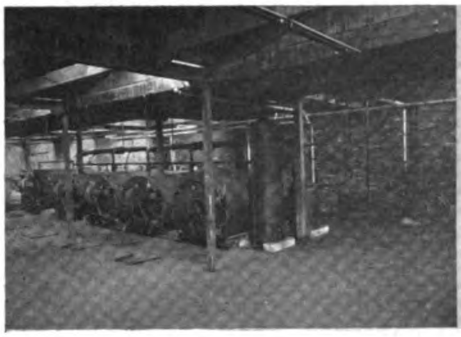

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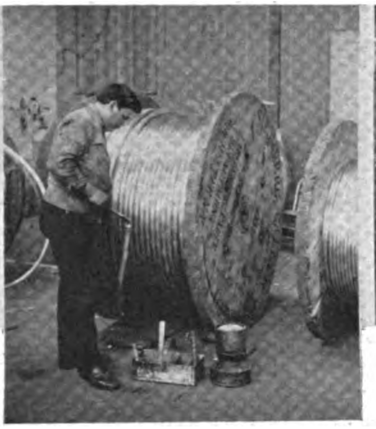

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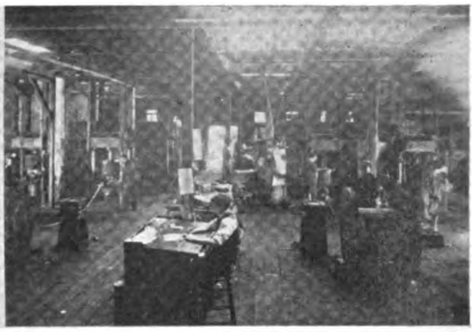

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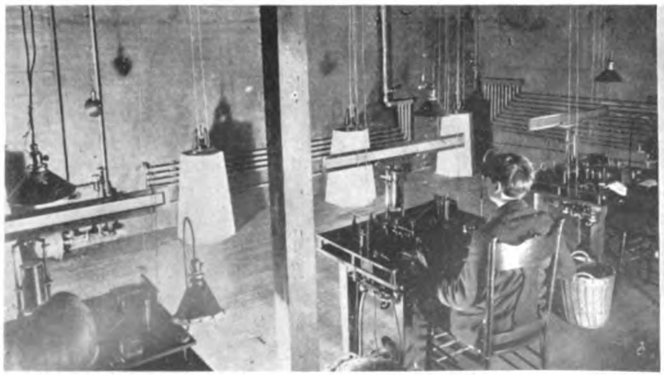

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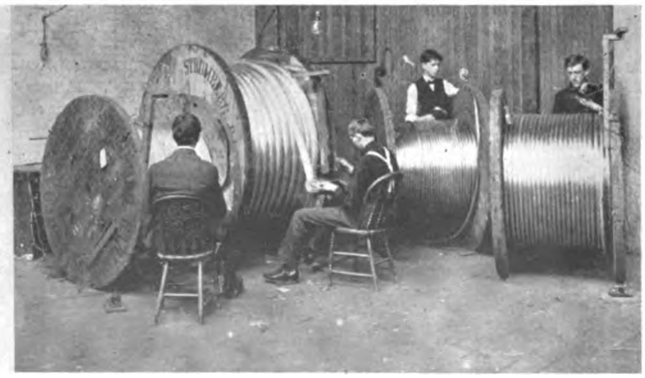

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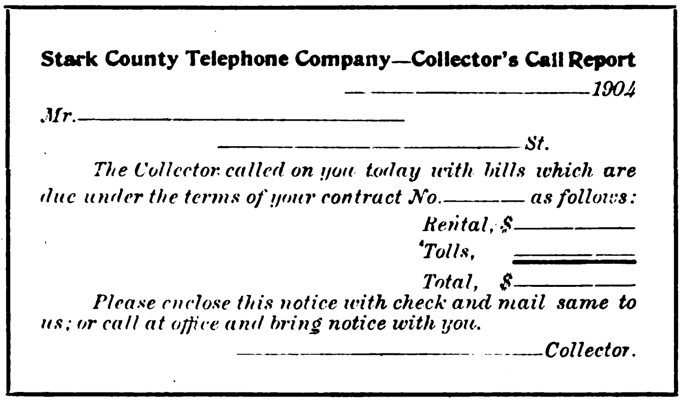
show name, rental, contract number and toll bill number, street address, whether one or more subscribers' bills are collected at this address and who they are. With a corrected routing list kept up daily, using the contract and toll bill number, bills can be routed accurately in a very short time. Collectors should note on the stubs of all service bills the date the subscriber was called on and the date he promised to pay. The bills returned at the end of the day should be gone over carefully by the manager or cashier, not only for the purpose of finding out the status of the subscriber's account, but to assure that the collectors are doing their duty.



Stark County Telephone Company—Collector's Call Report

______________1904

Mr.____________________

____________________St.

The Collector called on you today with bills which are due under the terms of your contract No.________ as follows:

Rental, $________

Tolls, ________

Total, $________

Please enclose this notice with check and mail same to us; or call at office and bring notice with you.

____________________Collector.

Call Notice Used by the Stark County Telephone Company.

In booking, billing and collecting telephone accounts, let us fix the fact firmly in our minds that we are collecting for something which we must consider as tangible and definite as so many gallons of water, so many feet of gas or so many pounds of sugar or meat. It is service performed for a definite period of time, just as much as the service of the water, gas or electric light company. As this is the case, we have a perfect right to press our claims and insist upon prompt payment according to contract. Our rights are equal to those of the electric light company, water company, gas company or retail merchant and our position as well taken. With a part of the public there seems to be a disposition to take the stand that the telephone company can wait for its money. They will pay everything else first, then, if there is any cash left, the telephone company will get it. We should make it our business to educate subscribers to the point where the housewife will set aside the money for telephone rent on the first of the month just as religiously as she does for other household expenses. When the subscriber is educated to this point then the collector's route should be so arranged that he will call on the subscriber within one day, at most two, of the time he knows the money to be waiting for him. Carelessness in this respect on the company's part will lead the subscriber to believe that it is not so important after all to have the money ready, as the company doesn't care enough about it to call on a stated day and get it. Here trouble will begin, and it is doubtful if the subscriber can ever again be made to make the effort he formerly did to have his money waiting for the collector. This means several trips for the collector and consequent loss of time and expense to the company. Collectors should be started on the first day of the month, if possible. Business men especially expect to pay their monthly bills for running expenses on this day and are generally prepared to meet them. With those business men of ordinary means it is sometimes a case of who gets there first while the money lasts. The chances are, therefore, in favor of the collector who first arrives.

The collector should be a person of good address, neatly attired, good natured, yet firm, and lastly, thoroughly familiar with the general conditions of the plant with regard to classes of service, rates, toll points and such other information as will be useful to the subscriber or necessary in settling a disputed point. He should make it a cardinal principle to uphold the dignity and good name of the company. He should feel that he directly represents the manager and should use every possible effort within reason to collect the account or settle a difficulty on the spot. It not only saves time, but puts the subscriber in good humor and prevents him from becoming disgruntled and talking over his troubles with others to the company's detriment. In dealing with subscribers firmness is just as necessary as politeness and good judgment. All three are necessary to success.

The subscriber has more respect for the company when it is firm in its demands and penalties, although he may get angry and abusive and talk about high-handed business methods. As a rule, neither the manager nor collector can afford to bluff. In ninety-five cases out of a hundred it does not pay. When a subscriber has been served with either verbal or written notice of the removal of his telephone, unless his account is paid by a certain date, the company should make good. The moral effect on the subscriber's friends and neighbors who are subscribers cannot help but be beneficial in letting them know what course the company pursues in cases of this kind. A method which has worked out well in practice requires the collector to leave a "call notice" in case the subscriber is not at home. This method is particularly effective where collections are made monthly.

The notice reads as follows:

CANTON, O., April 25, 1905.

John Doe, 225 Fair Avenue:

The collector called on you to-day with bills which are due under the terms of your contract, No. 1,061, as follows:

Rental	$1.25
Tolls	.70
Total	$1.95

Please enclose this notice with check and mail same to us; or call at office and bring notice with you.

C. L. WEBER, Collector.

If the subscriber has not paid his account by the time the collector starts over his route the second time the bill is again taken to him. If he is not at home, another notice is left for him, which is stamped across the face "second call." If he now fails to pay up in from three to five days, or as soon as we can get around to him again and the third visit finds him not at home, another call notice is left at his residence or place of business which is stamped across the face "third call. Kindly see that this account is settled promptly, as we cannot afford to make three or four calls for so small an amount."

If the third call notice brings no results he is then served with a written notice to the effect that unless his account is paid at the office by a certain date his service will be cut off.

In every case the heat coils are removed or telephone taken out on the date given in the notice.

The system as outlined has resulted in our company making the following showing for January quarter, 1905. This record has been nearly equalled several times. The total rental charge for the quarter was $18,252.18.

Per cent. collected	98.64
Per cent. rebated	.09
Per cent. carried over end of quarter	1.27
Total	100%

It has been my experience that success in collections depends in a very large measure on the proper education of the subscriber. As soon as he finds out you are going to insist on his paying his telephone bill just as promptly as he is required to pay his gas, water or electric light bill and that you call on him with regularity on certain days each month he will make up his mind that telephone companies are not to be fooled with or bluffed any more than the public service companies I have mentioned. When he is once brought to realize this the hard work in his case is completed and attention can then be turned to other delinquents.

INTERNATIONAL ELECTRICIANS TO MEET AT ERIE, PA., AUGUST 23, 24 AND 25.

FRANK P. FOSTER, secretary of the International Association of Municipal Electricians, announces that owing to the conflict of dates with other societies, it has been deemed best to alter the dates of its Erie, Pa., convention to the 23d, 24th and 25th of August.

Economical Engineering at Amsterdam, N. Y.

By Terrell Croft.

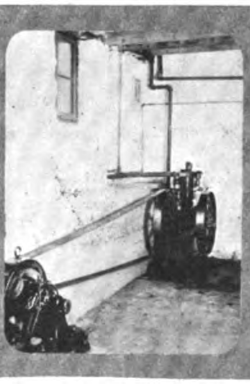
In the following article special interest attaches to the cost of construction. This cost averages $42.50 per subscribers' station, this figure including engineering supervision, switchboard, power plant, pole lines, cable and cable work, toll board and long distance cable, private lighting plant, building complete, with provisions for gas and electric light and plumbing, real estate, underground construction, office furniture and fixtures, records, soliciting, bookkeeping forms and 2,000 telephones installed. The outside construction is complete for 2,000 to 2,500 telephones and taking the average cost of labor and material for installing each telephone the cost of the plant when the 2,000 telephones are installed will be less $85,000, or less than $42.50 per telephone.

AMSTERDAM, a thriving Central New York mill town of 25,000 inhabitants, has a new telephone plant and an all cable distribution system of which it is justly proud. For economy of construction this plant, built for the Amsterdam Automatic Telephone Company, doubtless holds the palm. The company was organized about six years ago and operated an automatic system which, about two years ago, was entirely destroyed by fire. This system was temporarily replaced by a magneto system. Recently the directors decided to install are entirely up to date central energy manual system. As a result a thoroughly modern system of 2,000 telephones capacity has been constructed of the best materials and with a view to future economical maintenance and operation for a total cost of $42.50 per telephone. This amount includes everything necessary to the efficient operation of the plant. Le Roy W. Stanton, the engineer who designed and built the exchange, when asked how such a plant could be built for such a low figure and where the economies that made this possible had been effected, replied to the effect that the savings had been made in every department of the work. Economy had been the watchword, both in the designing and the construction, and wherever methods or devices that could economically save money were advisable they were applied. One of the greatest economies effected in the construction of the Amsterdam plant, Mr. Stanton claims, was in the layout of the multiple cable system. We have it on the authority of Arthur Vaughan Abbott (in his Vol. III of "Telephone Engineering," "The Construction of Cable Plants") that taking telephone wire plants, as they run over the country, it will be found that from 25 to 50 per cent. of the cable pairs in them are unavailable and lying idle. Before the multiple tap method came into vogue it was the practice to have conductors in a cable appear at but one point and if it were not practical to use all of the conductors at that point the unused ones would lie dead in the cable. It was necessary to plan generously to allow for fluctuations or changes in subscribers. Mr. Stanton so plans his system that a pair of cable conductors will appear at many points, and if it is not possible to use a certain pair at one point it will be available at several others widely separated from the first one.

Residence Street in Amsterdam.
On the right is the Bell Company's lead. On the left is the cable lead of the Independent Company.

Another fact that must be borne in mind in the planning of an economical cable plant is the proportionate fluctuation of service. It is an established fact that the per cent. fluctuation, or change in demand for service, is much greater in small groups of subscribers than in large ones. As an example it has been stated that groups of ten lines often fluctuate as much as 25 per cent., while

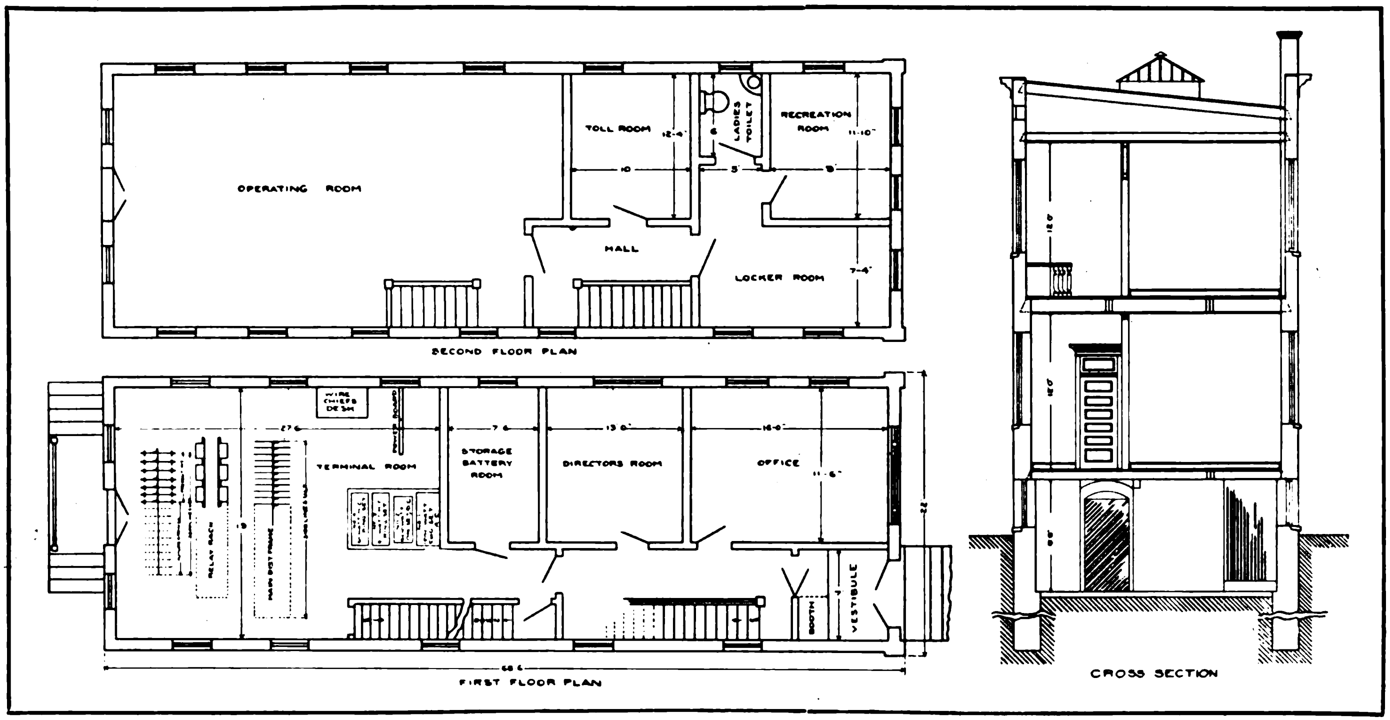
Street in Amsterdam.
Independent and Bell Leads.



Gas Engine.
Exchange Power Plant.

Another View.
Showing Independent and Bell Constructions.

with larger groups of 75 to 100 subscribers the per cent. of fluctuation does not very often exceed 5. At Amsterdam this maxim was kept in view in the planning of the cable layout. It has been estimated by Mr. Stanton that at least 25 per cent. was saved in the cable layout in conductors entering the central office by keeping this fluctuation principle in view; also in planning individual terminals the fluctuation proposition was watched constantly.



Cross Section and Floor Plans of Building.

A great amount of cable was used in the plant and no bare wire or crossarms. Subscribers are served by a rubber duplex wire, which runs direct from the nearest cable terminal to the subscriber's premises. The terminals (or cans) are connected at intervals, their frequency depending on the number of subscribers, along the lateral cable to be served. These cans are connected to the lateral cable by a short length of rubber "tap cable." The tap cable carries as many conductors as the terminal has capacity. Altogether there were about 146,000 feet of cable of different sizes used in the plant.

Cable is distinctly more economical than open wire construction. It is an engineering fact that in an open wire plant where the conductor must be of sufficient size to support itself the cost per mile of conductor is much greater than in a cable plant where the conductor is small and is supported by the steel messenger wire. A recognized authority states that wire of the size ordinarily used in open wire construction is 60 per cent. more expensive per circuit mile than No. 22 gauge copper wire per circuit mile when formed up into 100 pair lead-covered cable. Even galvanized iron wire (No. 12 of good quality) is also more expensive than copper conductors in cables. When it comes to cost of construction, the conductor enclosed in the cable scores another point in economy. It is much less expensive per circuit mile to put up cable containing many wires than to string open wire conductors. It has been authoritatively estimated that the cost of labor in stringing a circuit mile of bare wire on cross-arms ranges somewhere from $5.50 to $15, while the proportionate cost per circuit in a 100 pair cable is less than $1 per circuit mile.

Exchange. Building at Amsterdam.

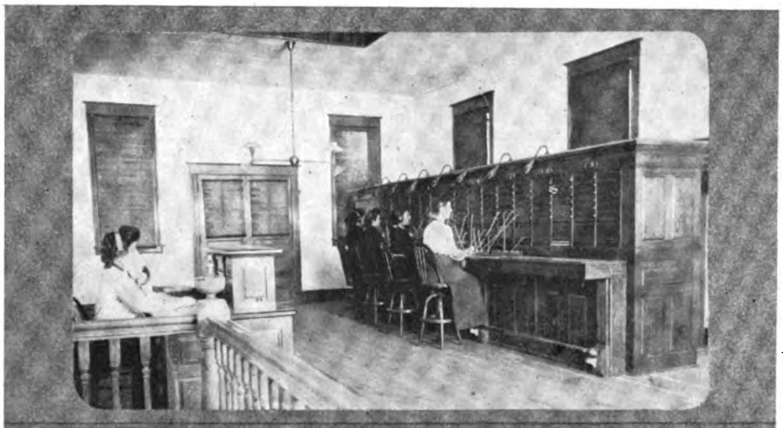
In an all cable system cross-arms, cross-arm braces and insulators are done away with entirely, and in view of the fact that it is only necessary to clear the cable over streets, much shorter poles may be used, which cost proportionately much less money than longer ones. The clearance of cable over intersecting streets governs the height of the all cable system pole line, while where open wire construction is adopted each pole must be of sufficient additional length to give clearance for every wire, not only over streets but also over all trees and every other obstruction.

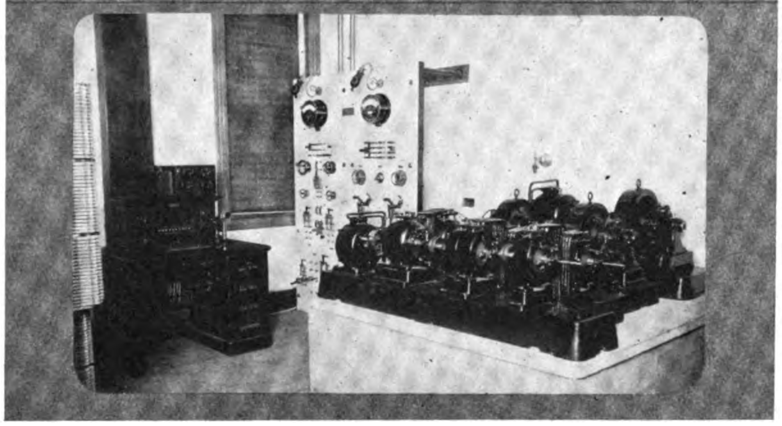
Terminals or "cans," as they are technically called, are distributed very freely along the cable routes. In the Amsterdam installation the average length of drop wire, from terminal to subscriber, is 157 feet. For these subscribers' drops, twisted pair or duplex wire was employed. This is the best quality of rubber covered, braided and twisted No. 14 hard drawn copper. Practically all companies now consider duplex subscribers' drops much superior to two single drop wires. Special insulators and methods of putting up this duplex drop make it cheaper and when these improvements are included this drop gives longer life and less trouble than the other drops. It costs about twice as much to install single wire drops as it does duplex, because twice as many insulators are required to carry them and almost twice as much labor is involved in the stringing as where the duplex method is resorted to. The special insulator on which the duplex conductor is attached at the pole and house is of special design, so as to reduce to a minimum the wear on the covering of the conductors.

The can pole terminals are secured to the poles with lag bolts. The cover, which slides up and off, is of heavy galvanized sheet iron and is secured to the terminal with a substantial chain, so that there can be no possibility of its falling to the ground when removed. These terminals are arranged to provide protection against both lightning and high potential currents. Everything is so simple about it that the possibility of trouble is almost entirely eliminated.

Another method by which Mr. Stanton feels that he saves considerable money is that by which he keeps tabs on the labor item in the construction of a plant. He has developed a simple system of time records which are turned in by the workmen and which show just how the men's time has been spent each day. From these original records an itemized labor report is compiled and turned in daily. On this is calculated the cost per unit of any kind of work done on the particular day to which the report is applicable. By scanning these with care it is possible to detect instantly any unusual conditions. The men, knowing that such close check is kept on their work, do not neglect the details nor allow the expense to become excessive.

Switchboard
Manufactured by North Electric Company.



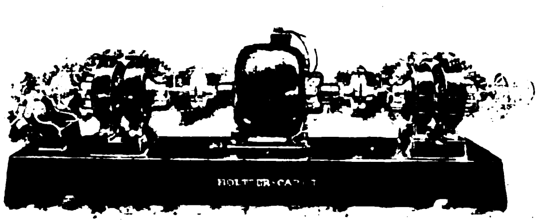


Wire Chief's Desk,
Motor Generator, Ringing Machine.

Because of the remarkably irregular layout of the town and of the flint rock formation on which the city is built, which made the digging of holes for poles and trench for subway difficult, the cost of a portion of the construction was unusually large. The city is cut in two by the Mohawk River, and three streams flowing into the Mohawk again divide the city into irregular sections. The development of the city follows these streams. It is six miles between extreme ends of the city.

It is predicted that the cost of operation of the plant will be extremely low, owing to the total absence of open wire and cross-arms and to the substantial construction.

In the leading hotel of the city, The Warner, was placed a Dean private branch switchboard having an ultimate capacity of 100 lines, with 80 installed. Five trunks are provided and there are three installed. A new feature in connection with this is that a 22 volt, 12 ampere hour B. T. type Chloride Accumulator is installed to furnish current. This method, which was inaugurated by Mr. Stanton in Cleveland, presents several distinct advantages. No trunk wires for feeding battery are required. Ordinarily two or six pairs of trunk wires are required for feeding battery, which represent a large investment. In connection with these it is necessary to use a 20 microfarad condenser, which is usually composed of ten 2 microfarad units. The first cost of this condenser is greater than that of the storage batteries. Current to charge the battery is furnished by the hotel's own private lighting plant and no expense is involved, as a 90 volt incandescent lamp is used as a resistance to cut the house voltage down to one suitable for charging. This lamp will be used to illuminate the switchboard, for which purpose a lamp would have to be used in any case. By the use of the storage batteries lamp signals can be used, which experience has shown furnish a prompter and more reliable service than electro-mechanical signals. A trunk circuit is worth to the company about $24 a year. This is saved where the storage batteries are used. Ten 2 microfarad condensers, at $1.35, cost $13.50; ten B. T. type Chloride Accumulators, installed complete at $1.05, cost $10.50. It is obvious that a private branch installation where local storage batteries are used is actually cheaper in first cost than where current is fed from the central office and beside the trunk battery feed, representing a large investment, is entirely eliminated. Experience in several cases has shown that the maintenance is lower and the service more reliable where lamp signals have been substituted for electro-mechanical. The method of trunking is a unique one. The operator is automatically monitored.



Multi Frequency
Ringing Generator for Dean Four Party System.

Plans of the three floors of the exchange building and a section are shown in the figure. It was constructed by contract under the supervision of the engineer. It is a two-story and basement brick building, with a pressed brick and stone front. The foundation is of stone laid in cement. The basement has a cemented concrete floor. The building is wired and piped for electric and gas lighting. The operator's locker room will be fitted with Merritt expanded metal steel lockers. The cost of the building complete with electric wiring, heating apparatus and plumbing was $7,200. The building is heated by the Garton hot water system. The plot, 50 x 125, cost $3,000.

The polished oak switchboard was installed and manufactured by the North Electric Company, of Cleveland, Ohio, and is of the double supervisory lamp signal type. It has an installed capacity of 1,080 individual lines, which will, with the usual average of two or three parties per line, give a present capacity of 2,000 or 3,000 telephones. The board is designed for an ultimate capacity of 3,600 lines. For party line service the Dean Electric Company, of Elyria, Ohio, furnished its multicycle ringing system. It is proving exceptionally satisfactory. This company furnished duplicate ringing generators and all of the telephones, both selective and direct line.

Special attention was paid to the toll equipment. The toll lines were carried from the end of the underground in a special 16 gauge (.04 capacity) cable, which experience has shown to give excellent results. So far as is known, this is the first installation of the kind that has been made in the Independent field. This cable is terminated on the main frame of the distributing board, where the circuits are protected. From here the circuits are carried through the same kind of cable to the toll board. This cable possesses many advantages. First—The conductors are of large cross section and have four paper wrappings, which prevent heavy lightning discharges from injuring the cable. Second—The low resistance and capacity of the cable materially improve its transmission qualities. There are no switchboard, wool-covered or shaft cables, which are very detrimental to good transmission in the toll circuits. The toll board is of North manufacture. It has a present capacity of twenty lines and an ultimate of forty. It is installed in a seperate toll room and is equipped for calculagraph timing.

The chief operator's desk is equipped for fully supervising the traffic. The wire chief's desk is equipped with a Weston instrument having volt and ammeter scales and the necessary keys and apparatus for efficient line testing.

The Cook self-soldering protectors are used, which are mounted on a main frame of his make. It has an installed capacity of 1,200 lines.

The motor generator charging machines are in duplicate. One can be operated by the city alternating current and the other is designed to receive energy from the company's private plant. The generators have an output of 800 watts at 40 volts. The alternating current motor is designed to receive power at 104 volts (60 cycles) speed 1,800. The direct current motor is designed for 110 volts and 12.76 amperes, speed 1,750.

In the basement the private lighting plant is installed. This consists of a 110 volt 2 K. W. multipolar Holtzer Cabot generator, speed 1,900, which is driven by a 3 H. P. Fairbanks-Morse gas engine, equipped with a volume governor.

The storage battery is in a separate, specially ventilated room and consists of duplicate sets of the Electric Storage Battery Company's type E, 120 ampere hour present, 200 ultimate capacity, Chloride Accumulators. There are 15 cells, giving an approximate voltage of 30 volts.

From a careful personal inspection of the plant it appears that the minutest attention has been given to the work in every detail. The plant for durability, long life and low operating and maintenance cost will probably stand for many years as a credit to its engineer.

The plant has already excited considerable interest among telephone men and has been personally inspected by men from San Francisco, New York and a number of cities in the Central West and has elecited surprise at its substantial and economic features. The company owning the plant is composed of the wealthy mill owners of this thriving city of Amsterdam and is officered by the following: Willis Wendell, president; Hon. W. B. Charles, vice-president; Geo. McClumpha, treasurer; Burton Fisher, secretary.

Besides these officers the directorate includes Hon. James K. Stewart, Lewis E. Harrower, Samuel Wallin, Daniel Ostrom, A. R. Conover and James T. Sugden. All of these men are well known and have other extensive interests beside telephone.

A New Method of Installing Underground Circuits

RAPID extension of the telephone early necessitated the placing of subscribers' lines underground, says Axel Hultman, manager of the Government Telephone Exchange, Stockholm, Sweden. To-day there is no large modern telephone system without underground cables running out of the central office. Not only town lines, however, have to be laid in this manner, but also the long distance lines, *i. e.*, the lines between cities, which become numerous in the neighborhood of important centers, must also be laid in some similar manner, for it becomes impossible to build the ever-increasing pole lines along railways and country roads, especially as the routes are often occupied by power circuits. The number of long lines in the neighborhood of Stockholm having become inconveniently large, the Swedish Telegraph Administration began experimenting in 1892 with a cheap mode of running lines, and has continued the experiments ever since.

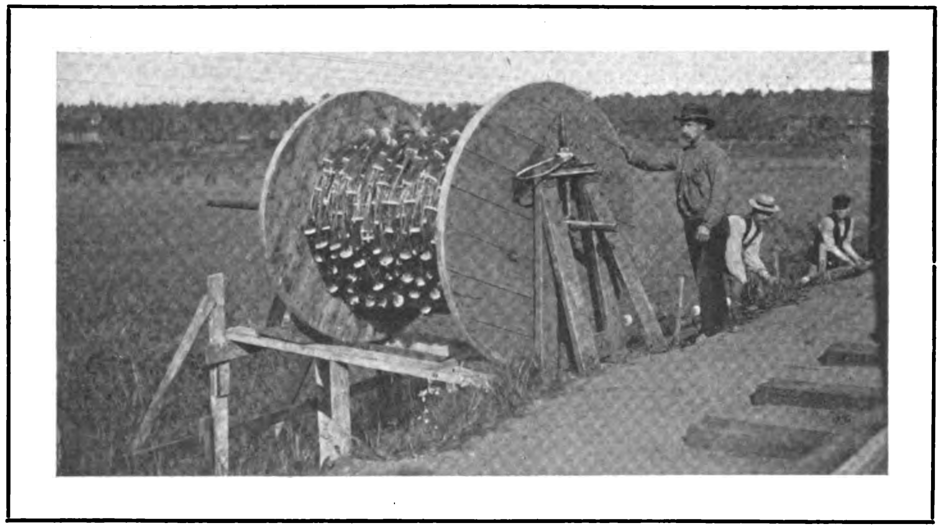


Fig. 1. Conductors Being Drawn from the Reel into the Underground Duct.

The capacity of long underground circuits must be kept as low as possible, which involves wide air spaces between conductors, air being the best of all insulating materials. The problem is therefore two-fold:

1. To make the conduit cheap and air-tight throughout, and at the same time to afford a complete mechanical protection to the conductors.

2. So to place the conductors in the conduit as to prevent induction and maintain permanently their relative positions.

While experiments have been made with lead-covered paper cables containing heavy copper wires, spaced as far apart as possible, it is doubtful whether the problem can be solved in this manner at a reasonable cost, for a wide spacing between wires cannot be obtained without an increase of outside diameter and a corresponding increase of cost; then, again, such heavy lead cables are difficult to transport and lay. On the other hand, in the system which I have succeeded in working out, the conductors can be spaced as far apart as permitted by the limits of cost and room available in each case, and without a considerable increase in the cost of materials, the capacity may be brought down 5 or 10 per cent under the lowest figures given below. The cables laid hitherto have the conductors of each pair 17 mm. apart, while the distance between pairs is 28 mm., and no conductor is less than 5 mm. from the conduit; this corresponds for 2-mm. conductors to 0.00985 M. F. per km. for the inner conductors, and to 0.0132 M. F. per km. for the outer conductors nearest the conduit.

By increasing these distances to 20, 36.5 and 10 mm. respectively, the capacity is reduced to 0.0935 and 0.0125 M. F. per km. respectively. It is manifest that with such low capacity and with the addition of loading coils underground circuits can be operated over very long distances. Experiments with the system were far enough advanced in November, 1900, to admit of public tests being made and officially certified to. The first experiments on a large scale were made in 1899. Owing, however, to various circumstances the first line was not satisfactory. The next experiment on a large scale was made in the spring of 1902 during very bad weather, but the insulation came out at 20 megohms per km., which remained the same in the spring of 1903, thus proving that the protection of the conduit could be relied upon. This line was laid rapidly, under very unfavorable circumstances, and so near the surface of the ground as to be exposed to the full effect of frost; it was partly laid on hilly and partly on marshy ground.

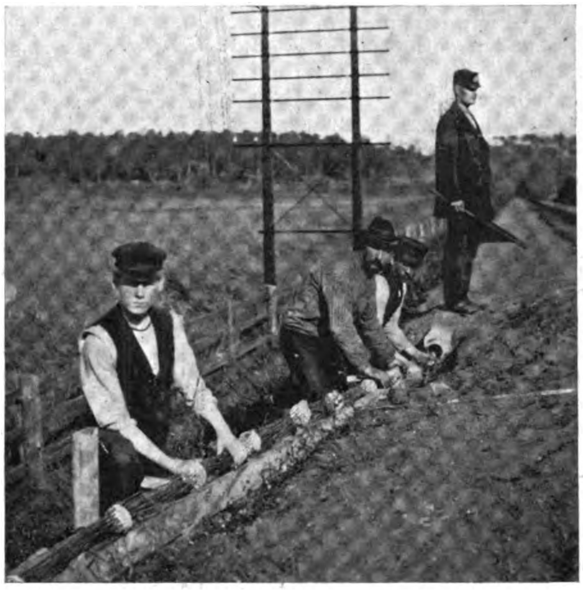


Fig. 2. Conductors and the Insulating Separators Entering the Duct.

The conduit is an iron pipe laid in cement, the joints between the lengths being in principle similar to those shown in German patent No. 125,464 (U. S. patent 680,151), although they have now been improved and changed in some respects. The next conduit line was built in the summer of 1903, but the conductors were not drawn in until 1904, and gave 264, 158 and 80 megohms per km.. Figs. 2 and 3 show the work of laying this line in progress. During the past winter the conduit laid in 1902 was taken up and carefully examined, the result showing that it had remained throughout in exactly the same condition as when laid.

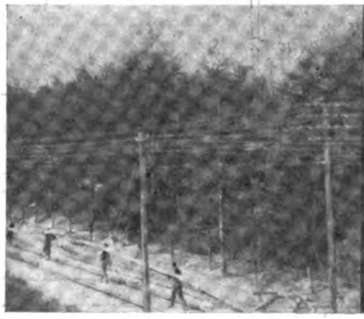


Fig. 3. A Section Of Duct Being Installed.

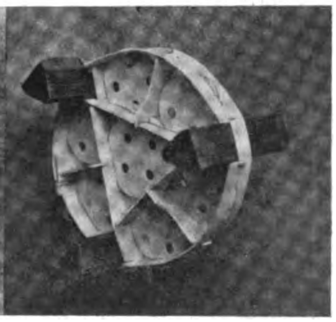


Fig. 4. One of The Insulating Disks.

In order to maintain the wires in place, a variety of disks have been tested. One of these is shown in Fig. 4 (U. S. patent 680,151, German patent 126,868). This disk has been changed and improved. Experience shows, however, that with the latest devices no contacts either between conductors or between conductors and conduits can take place after the cable has been drawn in and fixed in place. The new system has therefore been tested in every detail, and is now ready for actual use on a large scale. The mode of construction now used renders these cables more expensive than was expected, but not beyond measure, especially when the low capacity is considered. A 28-wire conduit and cable, laid down complete, can be made for kr. 5.00 to kr. 5.50 per meter, allowing a reasonable profit. In this price the conductors themselves are not included, as they may vary from 1 to 4 mm. A 76-wire route may be built for kr. 7.50 to kr. 8.00 per meter, and a 148-wire route for 12 to 13 kr. per meter. (The krone is worth about 1s. 1d.) Labor is the principal item of expense, but this is now brought down to a minimum by doing most of the work in the factory. On the ground the work is confined to the trenching, the laying and jointing of the conduit, and the drawing-in of the cable, operations which are simple and are done rapidly by trained men.

The conduits are laid along railways close to the surface of the ground, being covered only sufficiently to prevent interference with railway work. Into this conduit the cable is drawn, being brought from the factory ready provided with insulating disks. The drawing-in is easy, and takes only a few minutes for each section of 300 meters. The stringing of the wires through the insulating disks is done partly on a machine, and partly by hand. They are arranged exactly in fours, in such a manner as to avoid induction between conductors. This requires certain operations to be performed by hand, but these are reduced to a minimum. This hand labor pays, because it gets twice the number of conductors into the same space as would be occupied by paired wires. We are indebted to the editors of the London *Electrical Review* for the photographs and facts contained in this article.

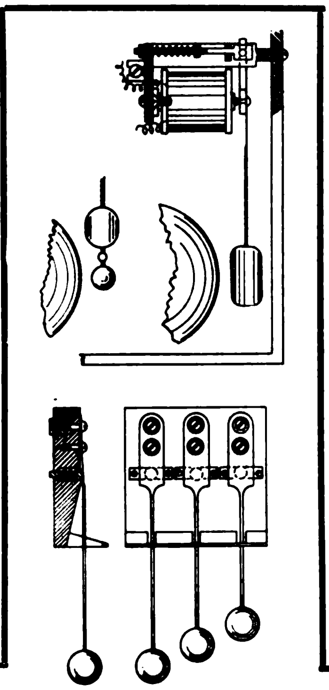
Editor's Note.—For over a period of five years, G. M. Gest, the American subway contractor, has been working quietly on lines somewhat similar but much simpler than those mentioned in the above article, and with results which have developed the really practical system of this character for economic and effective commercial service. Mr. Gest, about three years ago, laid a small section of his class of construction in Cincinnati, where it has been subjected to severe tests during that interval, and he is now about to construct a considerable quantity of this form of construction for one of the leading telephone companies. Patents covering his form of subway have been issued in this and other countries and this paper hopes in a short time to present to its readers the full particulars of this interesting invention. From the fact that a number of parties throughout the world are trying to develop long distance communication between cities, it is quite evident that it is only a question of time when the overhead wires between cities will be dispensed with and the public will have uninterrupted service in underground conduits which will be reliable at all times. These inventions open up to the telephonist a heretofore almost untrodden field.

Concerning Harmonic Party Line Systems

By W. W. Dean.

IN an article appearing in The American Telephone Journal of June 20, 1903, and entitled "A System of Selective Ringing for Telephone Lines," I discussed what I considered the most important selective party line systems in use at that time, and then described the harmonic selective system which I had developed for the Kellogg Switchboard and Supply Company. Since writing this article I have had two years' experience with this system and have learned a number of things which may be of interest to the telephonic fraternity. Incidentally I have developed a new system of harmonic selective bells. The harmonic principle is as old as vibration. Who has not observed that when he whistles, sings, or even coughs, that some inanimate object such as the glass globe of a chandelier, a vase or the strings of a piano which may happen to be in tune with the sound made will respond with a sympathetic vibration; and have we not heard the old story of a company of soldiers whose measured tread (happening to be in tune with the natural period of vibration of the structure) caused the bridge to collapse? The best general explanation which I have ever seen of the harmonic principle is given in Mr. Kempster B. Miller's book, "American Telephone Practice," fourth edition, pages 449 and 450. He says:

Fig. 1. Currier Bell and Interrupter.



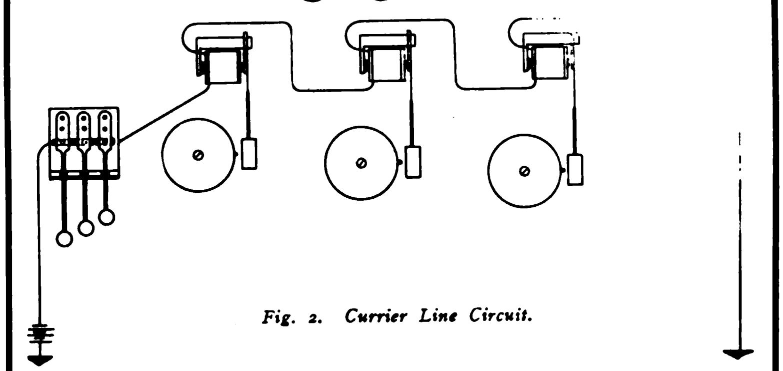


Fig. 2. Currier Line Circuit.

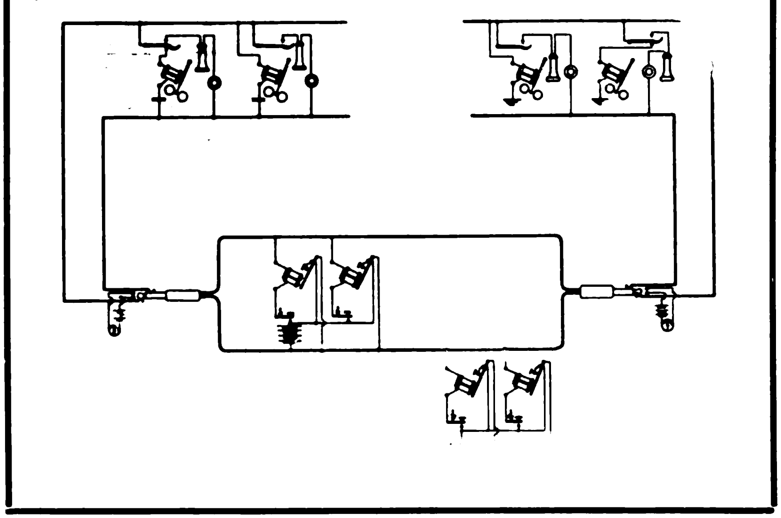


Fig. 3. Lighthipe Line System.

"These systems, with one exception, make use of the fact that every pendulum or every vibrating reed has a natural period of vibration, and that it can be made to take up this vibration by the action of a succession of impulses of force occurring in the same frequency as that in which the reed or pendulum vibrates. A familiar example of this is found in one person pushing another in a swing The swing has its natural period of vibration depending on the length of the ropes, and a gentle push applied at proper intervals by the person on the ground will cause the swing to vibrate with considerable amplitude. If the pushes are applied at intervals not corresponding to the natural period of vibration of the swing, many of them tend to retard rather than help its vibrations, so that a useless bumping results, producing but little motion.

"This idea was used in telegraphy before the birth of telephony. A number of currents of different rates of vibration were impressed upon the circuit by as many different transmitters, each particular rate of vibration being capable of operating a reed in one of the receiving instruments, and producing no effect on the others. By this means each receiving instrument was capable of picking out only those signals sent by the transmitter having the same rate of vibration, and thus all of the transmitters could be used simultaneously in the same circuit, producing a system of multiplex telegraphy.

"The plan of harmonic signalling on party lines was proposed before the year of 1880 by Messrs. Currier and Rice. They used magnets having armatures tuned to vibrate at certain fixed rates, one of these magnets being placed in series in the line at each station. All these magnets were therefore subjected to whatever current was flowing in the line. The armatures, or reeds, as they may be called, at the different stations, all having different rates of vibrations, did not respond unless the current on the line was of the corresponding frequency. Thus, by throwing a current of the proper frequency on the line, a reed at any one of the stations could be thrown into vibrations. When so vibrated, it served to close the circuit through a call-bell at that station, which was, therefore, operated.

"Nearly every conceivable form of circuit arrangement was tried during the succeeding years until nearly the present date, the work of Messrs. Elisha Gray, Frank L. Pope and J. A. Lighthipe standing out in some prominence.

"So far as the writer is aware, the only commercial application of the harmonic idea of selective signalling on party lines prior to the year 1903 was made by the local Bell Telephone Company of Sacramento, Cal., where a few lines were equipped and operated for several years on this principle. Although not an unqualified success, this single application served to show that the harmonic principle was feasible if it should ever be properly worked out. During the past two years Mr. W. W. Dean has applied himself to this problem, with the result that a four-party selective system has been produced, operating on the harmonic principle, which has already been put into wide use by the Kellogg Company, notably in the system of the Frontier Telephone Company, of Buffalo, and which gives every indication of proving an entire success.

"Nearly all previous attempts at the solution of this problem involved the use of relays with tuned armatures, so arranged that when an armature was thrown into vibration it would close the circuit of the bell, and thus in one way or another cause its operation.

"The work of Lighthipe seems to have been one of the exceptions to this general rule, and he caused the tuned armature itself to play between the two gongs which were to produce the sound. Lighthipe bridged his bells directly across the circuit of the line, as in the bridging system, a condenser being included in circuit with each bell. The same general plan has been followed by Dean, but he uses one gong instead of two, and a polarized responsive device instead of the usual non-polarized electro magnet."

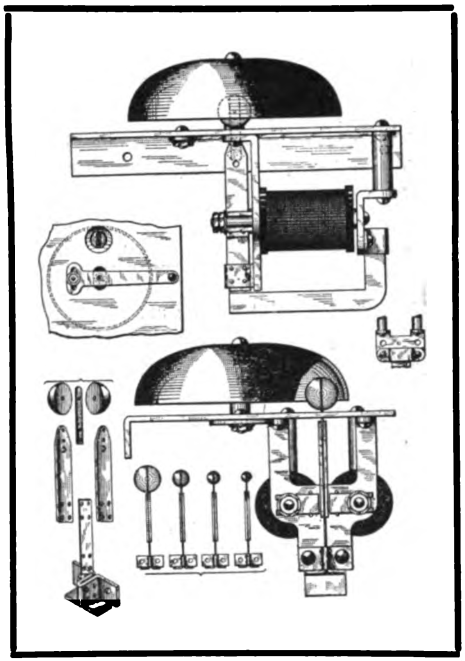


Fig. 4. Kellogg Harmonic Bell.

It must also be borne in mind that all harmonic systems are largely strength of current systems also. It can easily be seen that if enough energy is applied to a given tuned reed, that it can be set in motion whether the force applied be in tune with it or not. For instance, let us consider the seconds pendulum of a clock; by gentle blows furnished by the escapement at exactly the proper time, a very heavy pendulum is kept in motion. It can be seen, however, that if a person grasped the pendulum weight and shook it, it could be made to vibrate at almost any desired rate, dependent on the strength and agility of the individual. The foregoing illustration will show, I think, the importance of current strength in all harmonic telephone selective signalling systems.

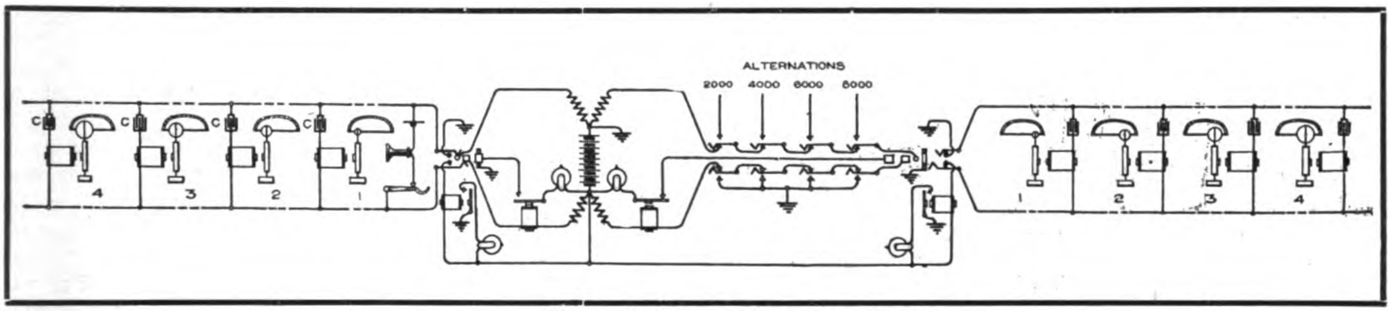
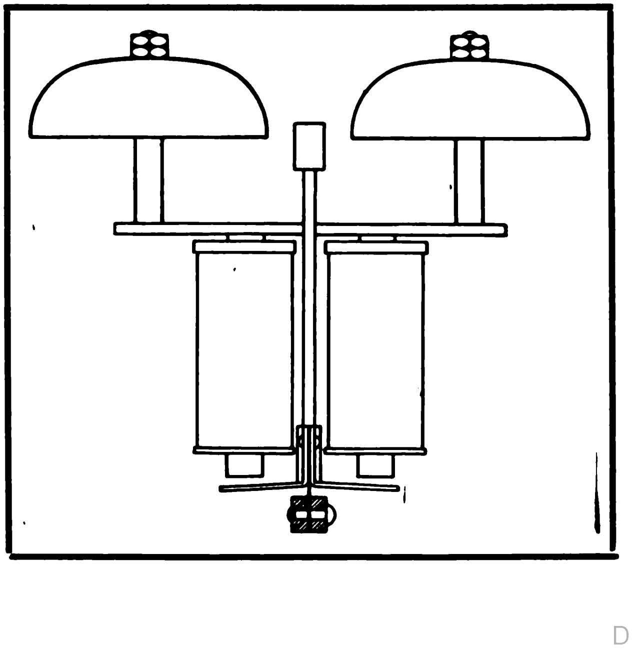


Fig. 5. Lighthipe—Kellogg—Dean Circuit.

The first commercial harmonic party line system was the one designed by Currier and used in the early eighties by the New England Bell Telephone Company. As used by this company, the pulsating currents were obtained by means of a battery interrupted by pendulums whose natural rate of vibration correspond to that of the bells to be rung. An "old timer" of the Bell Telephone Company told me that it was customary for the telephone installers or repairmen in adjusting a given bell, to tell the operator to ring on the line with the proper current and then to lengthen or shorten the spring suspension of the armature of the bell until it rang with the maximum loudness.

Fig. 1 is a copy of the drawing of Currier's patent, No. 351,097, and shows the construction of the bell and current interrupter. Fig. 2 represents a copy of the circuit drawing of the same patent and shows a number of harmonic bells in series on the line. The Currier system was used successfully (considering the preiod at which it was used and the state of the telephone art) for a number of years. The next commercial use of the harmonic party line system was that of Lighthipe's, as quoted from Mr. Miller's book. Fig. 3 shows a copy of the circuit drawing from Lighthipe's patent, No. 550,982.

The next system of this kind put into commercial use was the one designed by myself for the Kellogg Switchboard and Supply Company, and since put into extensive use. At the time this system was designed I had arrived at the following conclusions: I will quote from my article of June 20, 1903, as follows: "That it is practically impossible to operate a tuned bell of the type mentioned by means of pulsating or alternating current of the frequency or pitch corresponding to the natural rate of vibration of the tuned armature. In this party line system I apply to the lines ringing currents having frequencies corresponding to the operative rates of vibration of the reed tongues of the bells, and which are the resultant of the natural pitch of the reed as modified by the weight of the hammer or ball, and the action of the bell gong when struck. Thus the modification, so far as the gong is concerned, is in the line of accelteration, so that the operative pitch or resultant characteristics of the device as a whole is something higher than the pitch of the weighted reed alone. In other words, the gong in being rapidly struck serves to accelerate the vibration of the armature.

Fig. 6. Dean Harmonic Ringer. Normal Position of Armature.


"I have found also that the armatures used must be very rigid—almost to the point of junction to the tapper—but the connection between the armature and the tapper must be flexible or else the bells will not ring."

Following out these conclusions the harmonic ringer, shown in Fig. 4, was designed for the Kellog Switchboard and Supply Company, the line circuit for same being shown in Fig. 5. You will notice that the arrangement of bells on the line have been installed as in the Lighthipe system. A large number of bells have been installed under this system and have given good results. On account of having developed this apparatus very hastily and under pressure, I never felt thoroughly satisfied with it and felt certain that I did not achieve the best results possible. The following defects have developed in this system. On account of the bells being out of tune, they require more current to start their armatures in motion than if they were in tune. For the same reason the armatures are more apt to respond falsely or interfere. The method of operating of the under tuned harmonic bell is as follows: When current is first applied to the line, on account of static effects, a current of very high potential develops for an instant, like the crack of a whip, and gives the armature a jerk, causing the tapper to hit the gong; the armature being so tuned as to require the acceleration of the gong in order to put it in tune with the ringing current, now settles down to work and rings the bell. It is evident that the gong must be placed very close to the tapper in order that it may receive this first blow, or the bell will fail to ring. On account of the gong being so close to the tapper, it is apt to receive chance blows, thereby giving false rings.

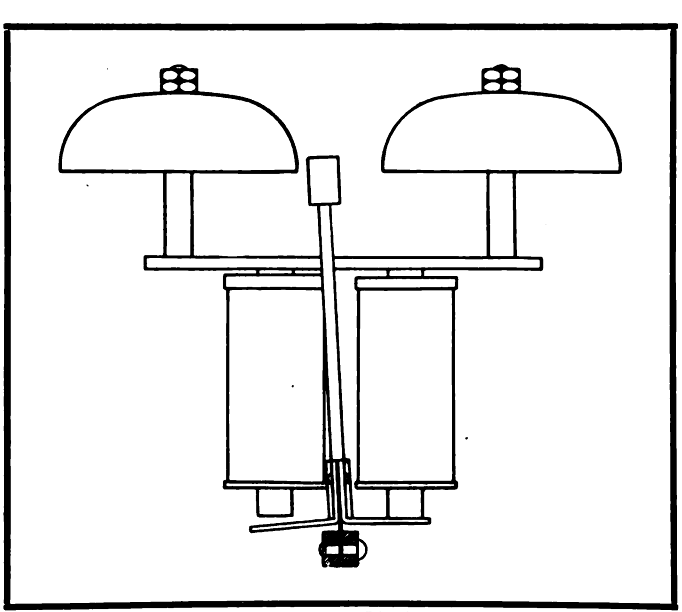


Fig. 7. Dean Harmonic Ringer. Ringing Position of Armature.

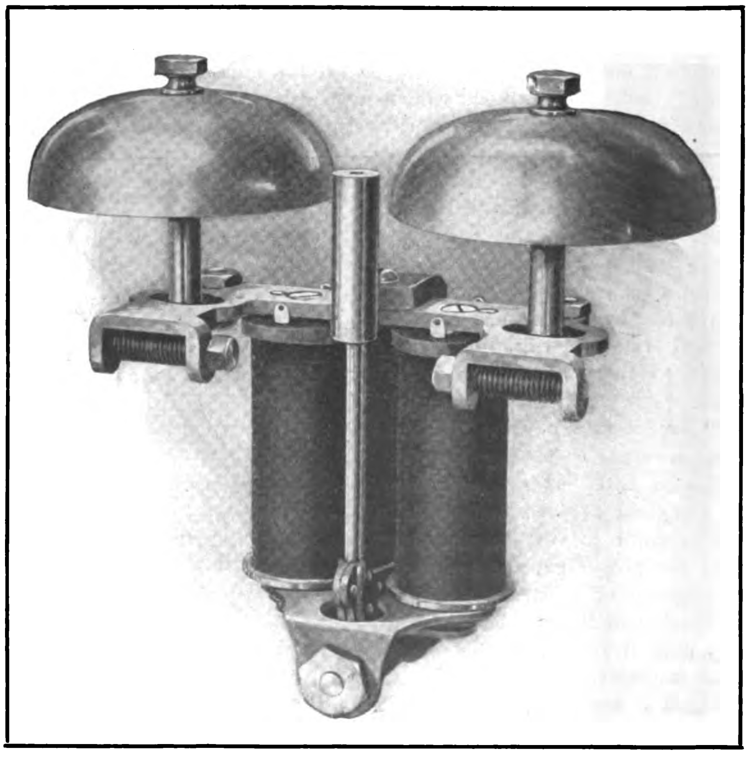
Another objection to the one-gong party line bell is that the tapper in the half of its vibrations away from the gong strikes nothing, consequently only one-half of the energy developed is utilized. By using two gongs instead of one, it is very evident that twice the number of blows are struck in a given period of time as with a one-gong bell. After putting the first harmonic party line system into extensive use, it was discovered that the low frequency currents were apt to affect bells turned to a higher pitch, but high frequency currents had very little effect on bells of lower frequency. This trouble was due to the fact that the voltages of our alternators were measured with a commercial voltmeter, whereas they should have been determined by taking readings of the maximum instantaneous voltage of any given wave. In the system recently developed this defect has been remedied in the following way: The generators are so constructed that the maximum instantaneous voltages of all the generators are about the same. Using a generator of this construction, a very much closer adjustment can be made with the higher frequency bells without danger of interference from currents of lower frequencies.

In developing the party line system now used by the Dean Electric Company, it was discovered that the conclusions arrived at in developing the Kellogg system were erroneous. In the new system the tappers are in absolute tune with the ringing currents and two gongs are struck instead of one. These results are accomplished in the following way:

Taking advantage of the fact before mentioned, that harmonic systems depend to a large extent upon strength of current, a bell was designed, as shown in Fig. 6. It will be noticed that the general design of this piece of apparatus is copied after the well-known telephone ringer, which has been used so successfully for many years and which was orignally designed by Watson. Practically the only differences are in the details of construction and in the fact that the armature is spring mounted instead of pivoted. The armature and tapper rod normally stand in the central position with reference to the pole pieces of the magnets and gongs. On account of the normal position of the armature, with maximum air gaps, giving a minimum magnetic pull, it will not be affected unless the energizing currents are in exact tune with it. When the proper current is thrown on to the line the ball will be thrown into violent vibration and the ends of the armature brought into contact with the pole pieces which are bare. The armature in this position is very strongly attracted and comes to a sudden stop on the pole pieces. The gongs are so adjusted that the tapper ball will have to spring about one-thirty-second of an inch in order to hit them. When the armature is alternately coming into contact with the two pole pieces of the permanent magnets the magnetic pull is so great that it is impossible for the striking of the gongs to throw it out of tune. The ringing position of the bell is shown in Fig. 7.

It is a well known fact, that a device in tune with the energizing force is many times more efficient than one which is not. In working with these absolutely tuned bells I have found that they can be constructed to give any desired degree of sensitiveness. Figs. 8, 9, 10 and 11 show views of the harmonic ringer assembled and in parts. It will be noticed that the whole construction of this ringer is very massive. The assembled armature, tapper rod and tapper ball are all riveted together in a power press and are absolutely non-adjustable. A micrometer adjustment is furnished for the gongs. In tuning the armature an adjusting weight is slipped on to the steel tapper rod, and by experiment, located in a position which will bring the armature system into exact tune with the ringing current. The rod is then scratched with a file, the adjusting weight is removed and an exactly similar weight is forced on to the rod to a point correspond-

Fig. 8. Dean Harmonic Ringer, Front View.



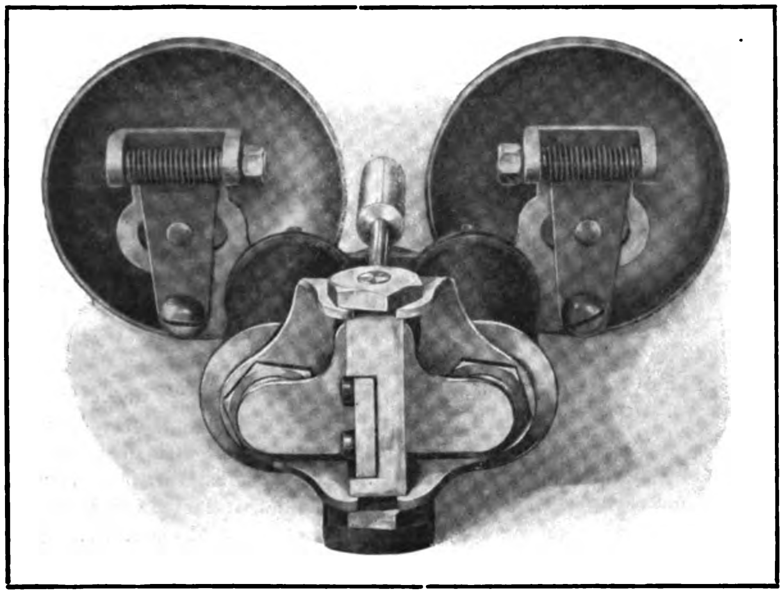


Fig. 9. Dean Harmonic Ringer, End View.

ing to the mark made on it. By this method it is evident that the adjustment of the armatures is not at the mercy of unskilled labor. A steel wrench is furnished for the different nuts of the ringer, so that there is no excuse for the repairmen using their pliers on them.

Another very valuable feature of this design is that it is no larger than the standard 1,000 ohm ringer, so that exchange owners having standard sets can remodel them for party line service. Another desirable feature obtained is, that when the ringer is installed the external appearance of the telephone instrument is exactly the same as the single line telephone, consequently the party line subscriber is as well satisfied as if receiving individual line service.

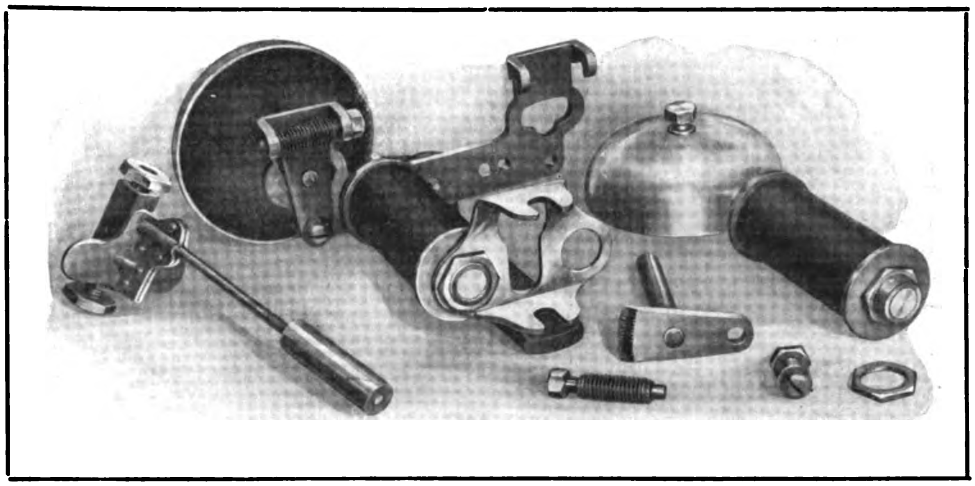


Fig. 10. Dean Harmonic Ringer Parts.

In conclusion I wish to say that two years of experience with these systems have convinced me that the harmonic party line system has come to stay and that some form of it will always be used in the telephone business. Personally I would not consider any kind of a party line system requiring earth connections, relays or step by step mechanisms. Prolonged experience has shown that any of these devices, at the sub-station are bound, sooner or latter, to give trouble, no matter how simple they may appear to be. The trend nowadays is to make the sub-station absolutely without complication. These conclusions are in accord with those reached in my article of June 20, 1903, in which I say:

"When I was called upon to design a party line system I decided that the following things were desirable: No grounds, no relays, no adjustable springs, no step by step mechanisms, and that the ringing of the bells should not be appreciably affected by either the resistance or capacity of the line. Leaving out the above possibilities, I was practically limited to some kind of a harmonic system.

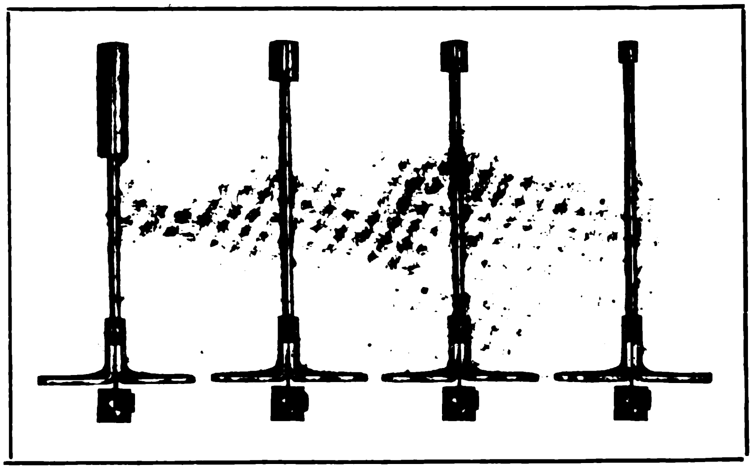
SOME EUROPEAN TELEPHONE FIGURES.

According to a report, said to have been issued by the German postal authorities, Germany has a telephone system 611,000 kilometers in length. Of other European countries the lengths of their telephone lines are stated to be as follows: France, 291,000 kilometers; Switzerland, 126,000; Austria-Hungary, 110,000; Sweden, 100,000; Russia, 75,000; Norway, 71,000; Denmark, 95,000; Belgium, 45,000; Spain, 39,000; Holland, 12,000. The number of connections are 306,000 in Germany, 72,000 in France, 32,000 in Austria, 17,000 in Belgium, 28,000 in Denmark, etc. The number of conversations reported reached 597,000,000 in Germany last year, 132,000,000 in Sweden, 187,000,000 in France, etc. The length of the telephone wires in Japan is given as 19,000 kilometers, and the number of conversations at 65,000,000. The Japanese, it is claimed, have to-day a better and more up-to-date telepohne system than many European nations. In all European countries, with the exception of Sweden and Switzerland, the telephone system is a source of revenue for the government.

RECEIVER ASKED FOR NORTH MANCHESTER CO.

A lawsuit which promises to be both important and interesting is the suit of L. J. Noftzger, at Wabash, Ind., against the North Manchester Telephone Company, more commonly called the Rex Company. The suit is for an accounting and a receiver. The contention of the complainant is that Mr. Rex, who owns a majority of the stock of the company, has controlled the business in his own private interest to the detriment and financial loss of the plaintiff and all other minority stockholders and that he has so controlled the company's affairs that the plaintiff has had no voice in its management. It is also alleged that under the Rex management a large and profitable business and plant has been reduced to a condition of insolvency. On the other hand, Mr. Rex enters a plea of general denial.

Fig. 11. Dean Harmonic Ringer Armature.



The Editor's Page

HERBERT LAWS WEBB AS THE DEVIL'S ADVOCATE.

In its efforts to block legislation that may lead to ruinous competition the Bell Company, of Canada, recently brought Herbert Laws Webb over from London to testify as an expert before the Parliamentary Commitee at Ottawa. This committee has been at work for several months conducting an exhaustive inquiry into the telephone conditions in the Dominon. As was to have been expected, much information damaging to the Bell has been elicited. Many details of oppression, arrogance, overcharge and illegal contract have been given the committee. Here and there have been found conditions even worse than those that characterized the situation in the United States before effective opposition set in. In at least one respect the Canadians were worse off than were the people on this side of the border. Wherever the citizens of the Dominon managed to build up an Independent telephone service, they found themselves against a blank wall as soon as they struck the railroad companies.

They found a cast-iron contract between these companies and the Bell, whereby the latter had the exclusive right to install telephones on the premises controlled by the railroads. The Independents were not even allowed to install free telephones at the railroad depots and ticket offices. But even this situation, vital under ordinary conditions to any public service, could not keep the Independents down. Witness after witness has appeared before the committee with facts and figures showing that the Bell was practically driven out of business where the Independents really took hold. If exclusion from the railroad depots was found a real menace, a station was established as near as possible to the forbidden premises, and a messenger service was maintained. Whatever the inconvenience, the Canadians cheerfully accepted it to beat the monopoly. And they succeded, giving an object lesson that ought to be brought home to some of our own communities, that show a lamentable lack of that civic courage which is necessary, if the people are to safeguard their institutions against the industrial brigands who have been sweeping away the rights of individuals with such a free hand in this country. It is true that none of the large Canadian cities have been developed as yet by the Independent telephone movement, but this is due to causes that will, no doubt, be remedied as the result of the Parliamentary inquiry now under way. It was to check this probable result that Mr. Webb was brought on the scene fresh from the conflict in Great Britain. He came loaded with statistics, facts and opinions, designed principally to show that the Canadian tendency toward municipal ownership of the local telephone service, and national government control of the long distance lines, is all wrong.

We believe that it is the general opinion among practical telephone men that, owing to the conditions peculiar to this industry, government ownership is not a desirable condition either from the standpoint of development or the best interests of the subscriber. It is hardly necessary, in view of our past utterances on the subject, to say that we are in accord with this general opinion. But we doubt that the advocacy of private ownership by Mr. Webb and the Bell Telephone Company will help the showing against municipal and national control. In Canada, where the municipal systems have come in competition with the Bell, as at Port Arthur and Fort William, the Bell has been routed, horse foot and dragoons. In Great Britain, though Mr. Webb has brought us most elaborate figures to the contrary, the results have been very much the same. Under the exclusive control of the National (Bell) Company the telephone situation was hopeless beyond expression in the British Isles. In comparison the American Bell was almost enterprising. It was only when the municpalities took hold that there was anything like progress, and if the telephone situation in Great Britain is still far from what it should be, it is certainly a thousand per cent better than it was under exclusive Bell domination. No better illustration of the facts may be had than is contained in the admitted statement of Mr. Webb, that common battery was unknown in England up to the time the national government took hold of the London service and installed a modern central energy exchange.

IMPORTED BY THE CANADIAN BELL FROM ENGLAND.

Until the governments, municipal and national, appeared as competitors, telephony was a farce in Great Britain, and no one knows this better than Mr. Webb. What Mr. Webb probably does not know, or at any rate does not appreciate, is that government control of the telephone is not to be overcome or prevented by perpetuating the control of the Bell company, but by giving a free hand to private competitive enterprise. If the Parliamentary Committee wants conclusive evidence of this, it has but to summon a body of representative citizens from any of the places where modern Independent plants have been installed in the United States. The business men of Rochester, New York; Kansas City, Mo.; Los Angeles, Cal., and scores of other places on this side of the line, can give testimony and information that will be worth more in each line to the people of Canada than is the whole of the "expert" advice furnished at large expense by the Bell company through the person of Mr. Webb.

Whatever its conclusions, the Parliamentary Committee should remember that Mr. Webb comes before it not as a free handed, free minded agent, but as the paid representative of the meanest monopoly Canada has to deal with, that he comes as the devil's advocate, with the devil very clearly seen in the background.

THE LOS ANGELES PLANT LAYOUT.

The exceptional development that the automatic method of handling telephone calls has reached in Los Angeles, Cal., which is treated of on another page, suggests a very interesting line of study. A year or two ago it would have been considered very uneconomical to have telephoned a city such as Los Angeles in the way it has been telephoned. It is probable that then the best engineering opinion would have dictated that the economic way would have been to serve all of the subscribers in the city with one, or possibly two, exchanges. Instead, those handling the Los Angeles proposition deemed it wise to use several branch and sub-branch exchanges, serving semi-detached groups. An engineer would ponder long before he would suggest such plant design for manual equipment. The possibility of being able to serve each detached group of subscribers in a city by means of a central office, situated near its centre, appears particularly attractive to the designer, who is constantly striving to cut down the length of the subscriber's line, and decrease the outside plant cost.

The Telephone in the Courts

Conducted by A. H. McMillan.

Readers are invited to submit questions on any point of Telephone Law. They will be answered and explained on this page.

RAISING RATES ABOVE THOSE FIXED BY FRANCHISE.

The following query comes from Indian Territory: Could you let me know through the columns of your paper what the law is in regard to the telephone company raising its rates above what was specified in the franchise? F. M.

THE general rule is that a telephone company cannot raise its rates above those fixed by its franchise. The franchise is considered by the courts to be a contract between the company and the municipal corporation granting it and both parties are held strictly to its terms. It is sometimes possible to avoid the application of the general rule in cases where the company had the right to do business in municipalities without the franchise, it being held that the contract was without consideration and therefore of no force and effect. Macklin vs. Home Telephone Company, 24 Ohio Cir. Ct. R., 446.

EXTENT OF GRANT UNDER FRANCHISE OF TELEPHONE COMPANY.

AN action of quo warranto was brought against the Nebraska Telephone Company to oust it from the streets and alleys of the city of Council Bluffs and from the public highways of the county of Pottawattamie generally. The petition alleged that the defendant, since October 1, 1897, without right of authority, had built its lines in streets where it had none and that these lines obstructed the streets and were nuisances and that the defendant was occupying the streets of the city and the public highways of the county without authority of law. The defendant pleaded the right to occupy the streets of the city and the rural roads under the general statute as it stood prior to the code of 1897 and that the city, on October 8, 1888, by ordinance, had granted it the right to occupy its streets for the purpose of carrying on a general telephone business in the city of Council Bluffs.

A reply was filed alleging that the grant by the city was void because of irregularities in the passage of the ordinance. From a judgment for the defendant the State appealed. The court held that Section 1324, Code of 1873, as amended, gave to any person or company the right to construct a telephone line along the public highways of the State, and, under the authority as given, the defendant had the right to occupy the streets and alleys of the city, as well as the rural highways or roads. The State's argument was that a change of the words "public highways," used in the former statutes, to the words "public roads," used in the Code of 1897, limited the defendant's right in the streets of the city to those actually occupied by it prior thereto. The court held, however, that the change did not limit or affect the rights of those who accepted and acted upon the grant given by the former statutes. "The grant to use the streets was without limitation as to territory, and under its authority there can be no question as to the right to extend the service to meet the demands of the public.

The court refused to consider the constitutionality of the statute on the ground that no constitutional rights were involved. It also declined to consider the validity of the title and passage of the ordinance, because it was conceded that the city had power to pass it, and the question could therefore not be raised in quo warranto proceedings. It was also decided that, as the record of the council showed clearly who was present at the meeting and that all of the members present voted for the ordinance, there was no merit in the claim that it was fatal to omit to record the name of each member with his vote. Judgment was affirmed. State v. Nebraska Telephone Company, 103 N. W. 120.

TAX OF ONE DOLLAR PER TELEPHONE NOT SUSTAINED.

JUDGE BISHOP, in the Circuit court at Geneva, Ill., has ruled against the city of Elgin in its case against the Chicago Telephone Company for a tax of $1 for each telephone in service in that city belonging to the Chicago Telephone Company, sustaining a demurrer by the company. When the first telephones were installed there no compensation was asked by the city for the franchise.

When the Independent company put in lines a tax of $1 a telephone was exacted when the franchise was given. The Chicago Company paid no revenue into the city treasury, but later free telephones were allowed for use in the city offices. The obtaining of a $1 tax per telephone from the Independent company, however led the Elgin councilmen to believe that a like amount should be exacted from the Chicago system.

SUIT TO COMPEL THE BELL COMPANY TO GIVE USE OF LONG DISTANCE LINES.

IN the United States Court at Helena, Mont., Judge William H. Hunt has heard argument on demurrers in the noted Eastern Montana telephone suits, those of the Montana and Wyoming Telephone Company against the Rocky Mountain Bell Telephone Company and the Billings Mutual Telephone Company against the Rocky Mountain Company. In these cases the plaintiff sought to compel the Rocky Mountain Company, under the provisions of Section 1,001 of the Civil Code of Montana, to permit them to connect their telephone lines in Yellowstone and Carbon counties with the Rocky Mountain system and have the use of the latter's lines. The suits were started in the district court, but removed to the United States Court by the defendant on the ground of diverse citizenship of the parties to the suit. The defendants claim the plaintiffs cannot appropriate their property and use it for their own purposes. The case was taken under advisement.

JURISDICTION OVER TELEPHONE RATES IS IN CITY COUNCIL; NOT THE COURTS.

IN overruling a demurrer of the defendants in the case of John Hipp against the Colorado Telephone Company on the ground that the district court had no jurisdiction to act in the matter, Judge F. T. Johnson, at Denver, Col., has handed down a decision that is of great importance in the numerous suits now pending against the telephone company for alleged extortionate charges.

Judge Johnson called attention to the new charter and held that upon sufficient showing, courts of equity have authority to remedy the evils growing out of corporate oppression, either to the community or to individuals when contract relations exist. He took the view that the provisions in Section 268 of the charter relative to the power of regulating corporations being reserved to the people, had no intention of interfering with the jurisdiction of the courts. Since the city council had taken no action relative to this provision, Judge Johnson held that until it does the case is practically without any effect for the purpose of fixing rates upon the defendant company. This decision will doubtless prove of special interest to telephone companies.

IN THE OPERATING FIELD.

CALIFORNIA INDEPENDENT TELEPHONE ASSOCIATION MEETS AT REDLANDS.

REDLANDS, CAL., was the meeting place of the California Independent Telephone Association recently. Twenty members of the association were present, and as guests of the local Home Telephone Company and of the Southwestern Home Telephone Company were shown through the new local plant and taken for a fifteen-mile tally-ho drive over the hills. At the association meeting, in the absence of John Van Lieu, president, who is ill, Mr. Parker Pomona, vice-president, occupied the chair. One of the principal issues was whether or not California should join the National Association. It was decided unanimously to join. A paper on "Rural Telephone Systems" was read by W. G. Freu, of Compton. Mr. W. T. Lambert described in a general way the new Automatic system just completed at Riverside and made the report that he had now 1,100 subscribers, although the exchange is only three months old.

The following companies were represented: Home Company, Los Angeles, Mr. E. L. Swain, assistant general manager, C. C. Craig second assistant; United States L. D. T. & T. Company, P. Kerr Higgins general manager, A. L. Orton manager and I. C. Brainerd secretary; Pasadena, Louis Blankerhorn, Santa Monica and Ocean Park, I. M. Baldwin; Monrovia, D. S. Parker manager, and Marshall J. Pomona; W. G. Freu, Compton, I. H. Breckenridge; San Jacinto, W. T. Lambert manager; Riverside, T. O. Hauser, manager; Corina, P. T. Spencer, Alhambra, etc., Manager Lamb; Redlands, Wardman Whitten and Downey Denning, Bannington, etc. Bigelow, Southwestern Home Telephone Company, T. W. Brotherton, B. F. Kierniff. There were other visitors and prospective members present.

HOME COMPANY'S APPLICATION FOR FRANCHISE REDUCES CUMBERLAND'S NASHVILLE RATES.

THE recent struggle of the Home Telephone Company to obtain a franchise from the Nashville, Tenn., City Council, though partially unsuccessful, has had the effect of bringing the Cumberland Telephone Company to consent to a reduction of rates in Nashville. At the time the Home Company's proposition was before the Council a committee was appointed by that body to interview the Cumberland Company and see if it would not consent to a reduction. This committee has submitted its report, and presents with it an agreement of the Cumberland Company to grant a general reduction. The last Legislature added about 20 square miles to Nashville's limits, and the Cumberland Company—which had been charging $1 per mile extra for service in the territory which was then outside the city but is now a part of it—agrees to make the charges for service in the whole city as it is now bounded the same; that is, the extra charge formerly made for outlying service is discontinued. This applies to all classes of service. A reduction of $1 per month for private line subscribers is given, making a net rate of $3 per month for this class. A reduction of 75 cents per month to $2.25 net, is given two-party line residence subscribers. The Cumberland Company will also make a reduction of 30 per cent from the regular commercial rate to the city of Nashville on all telephones used. These reductions go into effect on July 5.

INDEPENDENT INTERESTS GRANTED FRANCHISE IN PORTLAND, OREGON.

INDEPENDENTS will now have a stronger foothold in the Northwest. A franchise was granted June 5 by the people of Portland, Ore., to F. F. Graves and associates, of Los Angeles, Cal. The vote was 12,874 in favor of telephone competition and 566 against it. Arrangements are being made to start construction in Portland at once and it is expected that the plant will be in operation in less than a year.

REPORT THAT FEDERAL COMPANY WAS TO LIQUIDATE IS UNTRUE.

A REPORT has been circulated that the Federal Telephone Company at Cleveland, Ohio, was to be liquidated at once. The story was sent out from Cleveland some days ago. President Dickson says the statement is entirely misleading. It has been the intention of the men who are handling the affairs of the company to liquidate it at some time in the future, but he says the time has not come, and so far as the indications are at present is not likely to come for a time. The situation, he says, is just the same as it was two years ago. When the financial affairs of the Everett-Moore syndicate are finally wound up the Federal will be liquidated, but there will be no hurry in the matter.

TOLEDO HOME TELEPHONE COMPANY DECLARES QUARTERLY DIVIDEND.

THE directors of the Toledo Home Telephone Company met recently and declared a 1 per cent. quarterly dividend, payable on July 10 to stockholders of record July 1. A. H. Bauer and H. C. Stifle, of St. Louis, Mo., were elected directors to fill two vacancies on the board. The St. Louis men elected to the board are the capitalists who recently acquired all the stock held outside Toledo, amounting in all to about 15 per cent. of the total.

CHAGRIN FALLS, OHIO, PLANT WILL STILL BE INDEPENDENT.

THE sale of a controlling interest in the little telephone exchange at Chagrin Falls, Ohio, a few days ago marked the end of one of the most stubborn little tussles that has been seen in Ohio for a long time between the Bell and the Inde-

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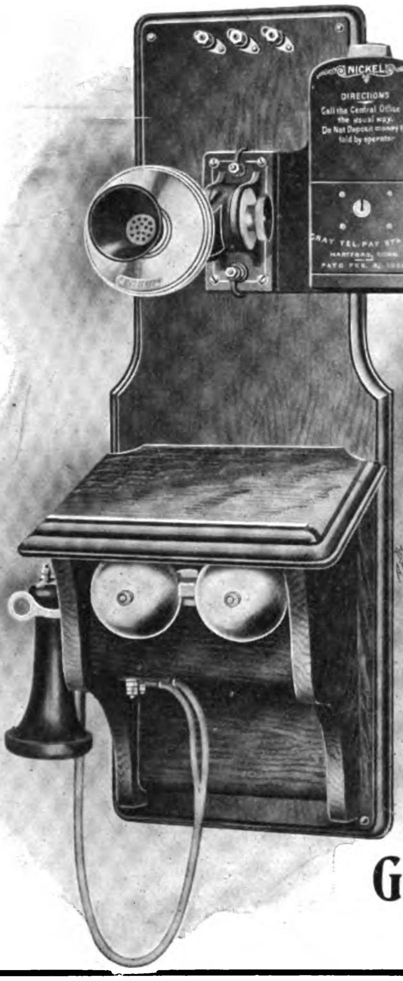
THE AMERICAN TELEPHONE JOURNAL is always in the market for crisp, snappy news or technical contributions. Descriptions of ways to do things telephonic, illustrated with sketches, and also descriptions accompanied by photographs are especially acceptable and will be paid for. Literary skill is not essential, but is, of course, appreciated. Send your sketch, photographs, and write the matter as well as you can. It will be dressed up, if necessary. Here is an opportunity for telephone men from engineers down to ground men to increase their incomes. An article cannot be too technical nor too elementary for us to consider. Articles illustrated with photographs are particularly desirable and will be substantially acknowledged.



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WANTED—Position as manager or superintendent of construction, by man who has had 10 years' experience. One who is not afraid of work. Address Box 392, care THE AMERICAN TELEPHONE JOURNAL, 116 Nassau Street, New York City. 392

WANTED—Thoroughly competent man wants position as Manager of Independent exchange of from 500 to 1,000 subscribers. Ten years' experience. Manager of Bell Company for five years. Address, Box 393, care THE AMERICAN TELEPHONE JOURNAL, 116 Nassau street, New York City. 393

WANTED—Men who have local lines in their charge to act as agents for our patent insulators. Send for circulars, sample and price. It will pay you. Address Claydon & Sons, Tabor, Texas. 386

WANTED—Every telephone man to send us your switchboard apparatus and instrument repair work. Coil winding a specialty. Our prices are low. We return work promptly. Address Jester & Millikan, Marion, Ind. 387

WANTED—Salesman to sell Rock Island Dry Batteries. Commission basis only. Apply at once in writing to the Rock Island Battery Company, Rock Island, Ill. 391

POSITION WANTED—By high grade technical man. Wide practical experience. Can show results in business, operating or construction departments. Good references. Address, Box 394, care THE AMERICAN TELEPHONE JOURNAL, 116 Nassau street, New York City. 394

POSITION WANTED—By a good technical and practical telephone man as salesman. Sales experience and has a territory in the Middle West which he can hold. Address, Box 395, care THE AMERICAN TELEPHONE JOURNAL, 116 Nassau street, New York City. 395

IN THE OPERATING FIELD—*(Continued.)*

PROGRAMME.

First Annual Convention of the National-Interstate Telephone Association, Held at the Auditorium Hotel, Chicago, June 20-21, 1905.

Morning Session—June 20.

Meeting called to order at 10 o'clock.

Address of welcome, Hon. Edward F. Dunne, Mayor of Chicago.

Response, S. P. Sheerin, president New Long Distance Telephone Company, Indianapolis, Ind.

Address, "The National-Interstate Telephone Association," Jas. B. Hoge, Cleveland, Ohio.

Address, "Ways and Means to Make Our Association a Success," Theodore Gary, Macon, Mo.

Address, "Shall the Independent Companies Have an Insurance Company of Their Own?" Jas. S. Brailey, Jr., president Toledo Home Telephone Company. Discussion.

Appointment of committees.

Address, "Combined Telephony and Telegraphy," Samuel G. McMeen, C. E. E., Chicago, Ill. Discussion.

Adjournment for lunch.

Afternoon Session—June 20.

Meeting called to order at 2 o'clock.

Roll call of States.

Paper, "Standard Toll Signs," W. F. Laubach, Akron, Ohio. Discussion.

Address, "Value of Telephone Securities," A. B. Greenshields, Philadelphia, Pa.

Adjournment for the day.

Morning Session—June 21.

Meeting called to order at 10 o'clock.

Report of Committees on Standard Operating Rules and Regulations, Standard Forms of Accounting, Standardization of Equipment and Best Methods of Advertising.

Afternoon Session—June 21.

Reports of regular and special committees.

Transaction of any miscellaneous business.

Election of officers.

June 22 will be devoted to an inspection of manufacturers' exhibits and in the evening there will be a banquet.

pendents. It ended in a victory for the Independents. The exchange has a value of about $20,000 and has 300 subscribers. It has been owned by a local syndicate, but was affiliated with the Independents. The death of one of the principal owners made a change of ownership imperative and the Bell people undertook to buy a controlling interest. They offered a fancy price, but the Independents went after it, not intending to let the Bell people link any of the Independents to their through lines. A syndicate was formed at Cleveland by James B. Hoge, president of the National Association, and the controlling interest was purchased and the control of the exchange turned over to the Cuyahoga Company at Cleveland. It will be operated by the officers of the Cuyahoga and will remain a part of the Independent system.

COL. DICKSON, OF THE CUYAHOGA, WRITES AN INDEPENDENT TELEPHONE BOOK.

COL. FREDERICK S. DICKSON, who is at the head of the United States and Cuyahoga Telephone Companies at Cleveland, will shortly issue a booklet he has written on Independent telephones. Those who know something of the incisive style and clear statements that mark Col. Dickson's writings will know how interesting he has made this new offering and will appreciate the tremendous power it will exert in molding public opinion favorable to the merits of the Independent telephone movement. The book will discuss the question of values in the securities of the Independent Telephone companies, the effect competition has had and will probably have on these securities during the future, and the probable result of future inventions and changes in the mechanical devices employed.

The story will be told in plain language. The details of the construction and operation of a plant will be told in language free from technical expressions, so that the ordinary layman may understand what is told. It is the statement of a business man to business men in which the merits of a growing business are set forth in a most entertaining manner. Col. Dickson was called in to take charge of the telephone properties of the Everett-Moore syndicate three years ago, when that syndicate's financial affairs were in a very badly tangled and involved condition. The average monthly surplus of the sixteen telephone properties the syndicate controlled during the year 1902 amounted to $50 per month. Under the guiding hand of Col. Dickson, even while he was handicapped by lack of funds for proper development, he has developed the business so that the surplus earnings of the Cuyahoga Telephone Company alone for April amounted to $8,380. The United States Telephone Company had a surplus of more than $6,000 for the same month and every other one of the subsidiary companies had a handsome surplus. Not only has he been able to do this but he has simplified the financial conditions so that the securities of the various companies are selling readily in the market.

Another feature of the work he has done has been the novel and highly effective style of advertisng matter he has used. It is plain and pointed, cuts straight and clear, attracts attention and interests the reader. A number of the ads he has employed most effectively have been reproduced in these columns, and his plans are being copied all over the country. He has developed the business of the Cuyahoga in the face of the most aggressive and influential competition so that the number of subscribers has grown from 8,500 to 16,000 on June 1st, and is adding new subscribers at the rate of 600 a month. His experiences have made him abundantly competent to write concerning the business, and in the preparation of the book he has gone along entirely new and novel lines. He believes in giving complete information to the public of what is being done, how and why, and he has been successful in a most extraordinary manner in arousing a friendly public interest in his company and in the work at hand. The book is to be issued during the present month.

CONTRACTORS' CONVENTION AT BOSTON PROMISES TO HAVE LARGE ATTENDANCE.

FROM all indicatons the coming International Electrical Exposition in Mechanics Building, Boston, July 15 to 22, will be the biggest show of its kind on record. Manager Campbell has already been notified that thirty-nine States will send delegates to the fifth annual convention of the National Association of Electrical Contractors, to be held at the same time and place, and a large and efficient reception committee will extend welcome and entertainment. The manager's address is Chester I. Campbell, 5 Park Square, Boston, Mass.

LE ROY W. STANTON

Consulting and Constructing Telephone Engineer

ELECTRIC BUILDING
CLEVELAND, OHIO

1644 MONADNOCK BUILDING
Chicago, Illinois

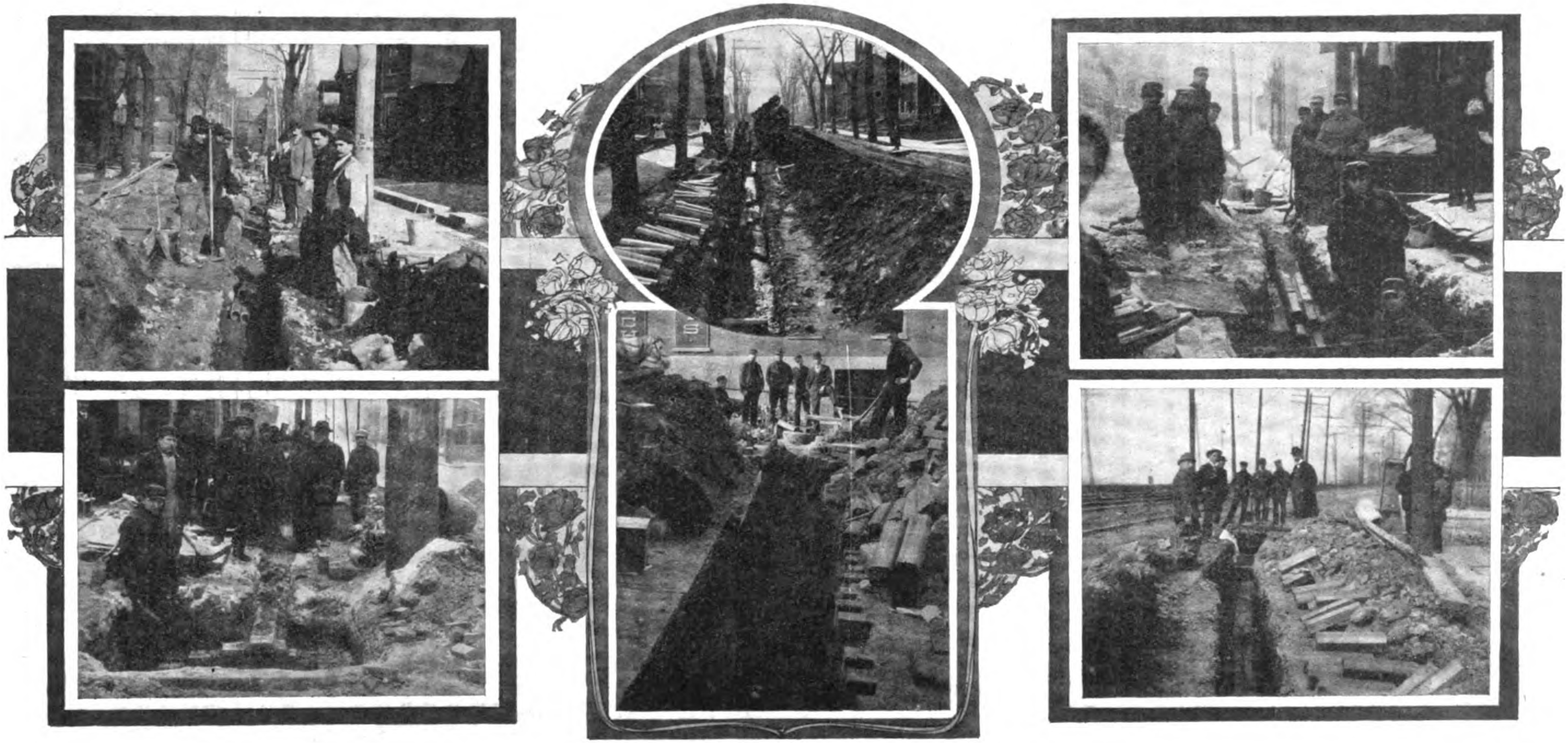
A Permanent and Valuable Investment Is Wire,

when placed underground in accordance with the most approved engineering practice.

STOP! LOOK! THINK!

WHAT A SAVING CAN BE EFFECTED IN FIRST COST, AND IN MAINTENANCE, by employing trained and experienced construction men. Inferior construction is often 25% more expensive in first cost than first-class work.

Did you ever do anything that you could not do better and cheaper if you could do it over again? Then why not have experienced men save you expense and trouble? There are many little points of importance which are not thought of, or are neglected until too late, by men with limited experience. Improperly planning an underground conduit system often makes a cable plant hundreds of dollars more expensive than it should be.



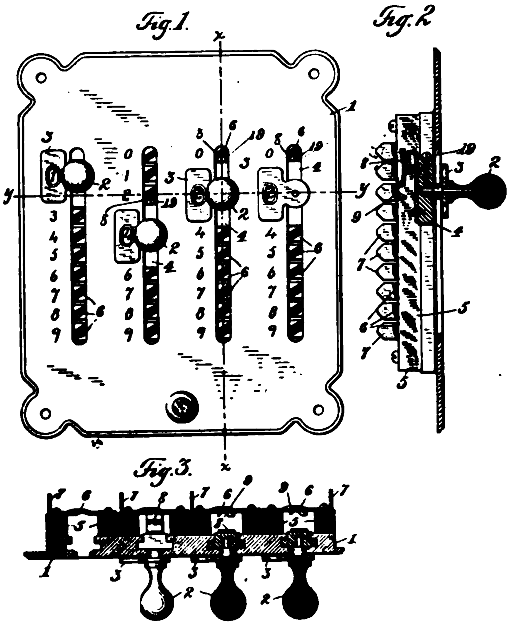
The above are views of conduit construction in two of the plants now being completed by **L. W. Stanton**, the consulting and constructing Telephone engineer of Cleveland and Chicago.

I have technical men with years of practical experience and trained in the school of practical economy for carrying out each detail in modern telephone construction. *It* is only through modern business organization and trained men that capitalists can expect to meet the stifling competition of to-day.

TELEPHONE PATENTS

INDICATOR FOR SIGNAL TRANSMITTERS.

George William Lorimer, of Piqua, Ohio, patents No. 790,966; an indicator for signal transmitters. This device is primarily intended for use in conjunction with subscribers signalling devises employed to secure connections in automatic systems. The object of the invention is to provide a means whereby the possibility of error in desired signal combinations shall be avoided For this purpose the inventor provides an indicator plate 1, Fig. 1 having four vertical openings which serve as guides for the movements of the signal switches 2. To the right of the openings are figures which run from 0 to 9, respectively. Attached to the handles 2 of the switch mechanism are index plates 3 so arranged as to cause their openings to disclose the numbers upon the face plate underneath when in proper position. By examination of Fig. 2 it will be seen that the switch handle 2 is connected to conducting block 4. This conducting block carries a spring contact 8 having an end surface 9 so curved as to fit the recessed surfaces of the terminal contacts 6. These contacts are mounted upon insulating strips 5.



When the switch handle is moved, the error due to misplacement of the contact spring 8 with the terminals 6 is reduced to a minimum by the employment of the curved contact surfaces as shown in Fig. 3, which lie at an angle with relation to the movement of the switch handle, and also to the longitudinal spacing of the terminal plates. This arrangement prevents the contact spring from dropping into the space between the terminals and giving false connections. The curved surfaces of the terminals and contact spring also indicate when a correct connection has been made by the slight resistance that is offered to further movement away from that position.

AUDIPHONE INSTRUCTION SET.

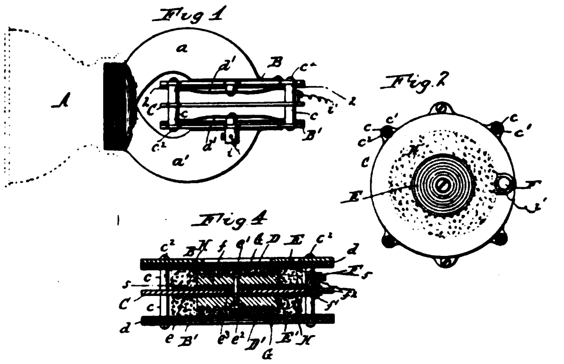
Herman G. Pape patents (No. 791,573) an audiphone instruction apparatus or set. This invention is intended for the simplification of instruction for persons having impaired hearing. It essentially consists of circuit combinations and methods of attaining the same, whereby at the instructor's will the desirable volume of sound to use for a certain pupil's instruction may be varied and at the same time the correct conditions of other circuits maintained for pupils whose hearing qualities may be impaired in a greater or less degree. Also switching arrangements whereby a pupil can vary the conditions of the audiphone circuit so that talking or hearing can be carried on as desired.

TELEPHONE TRANSMITTER.

Walter L. Wilhelm, of Buffalo, N. Y. Patents No. 790,945; a telephone transmitter.

In the design of this transmitter the object has been to incorporate in the one instrument a pair of variable resistance chambers arranged in multiple and so situated as to be simultaneously responsive to the same air waves. The inventor accomplishes the result by the employment of a containing frame having two external parallel plates or disks B B^1 and an intermediate plate or disk C, Fig. 1. These plates are spaced apart by suitable supports, such as hollow posts c arranged between the secured to marginal ears or projector c^1 on the several plates, Fig. 2.

Attached to the central plate C, Fig. 4, but insulated therefrom by means of insulating disk e, are two carbon electrodes E E, which together form one side of the circuit of the two variable resistance chamber. D D^1, Fig. 4, are the two transmitting diaphragms which are fastened to the supporting plates B B^1, but slightly separated therefrom by spacing rings d so as to allow free vibration. G represents the granular carbon resistance varying material between the outer surface of each carbon button and the inner surface of the adjacent transmitter diaphragms. This granular resistance material is retained in position by means of rings H H of suitable material, preferably made of fibrous material which is sufficiently dense to prevent the carbon granules from working out and yet *sufficiently* elastic enough to permit the diaphragms to vibrate freely. The transmitter herewith described on account of its duplex character embodies the advantages of both double and single diaphragm solid back transmitters for two simultaneously-vibrating diaphragms are secured, thus greatly magnifying the volume of the sounds transmitted.



WIRE CONNECTING TOOL.

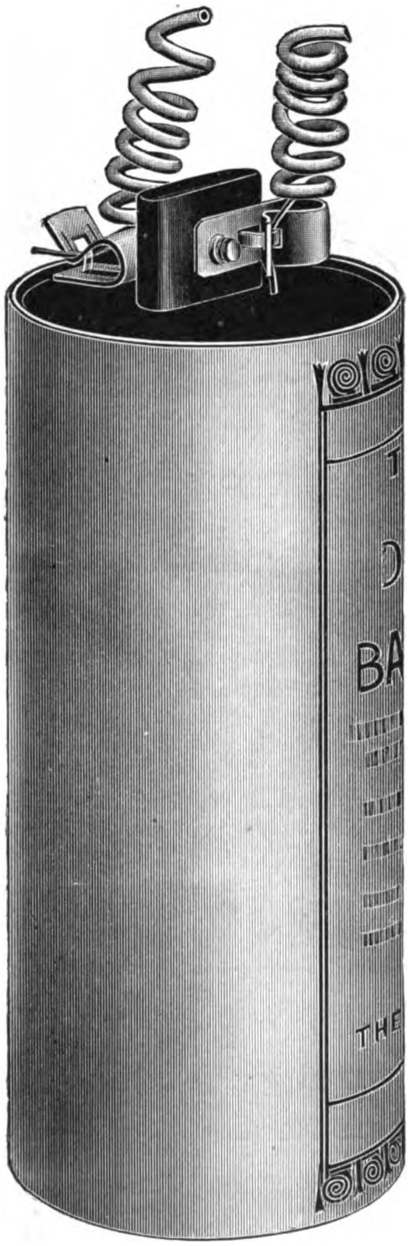
Clarence C. Sibley patents (No. 789,941) an improved tool for connecting wire to screws, bolts, or similar objects. It essentially consists of a screw-driver having a sleeve with a projection, the purpose of which is to engage a wire and wrap it round a screw at the same time that the screw is being turned by the driver. The sleeve is arranged to slide on guides so that it may be raised when it has performed its requisite winding function to enable the screw-driver to further complete its operation of fastening the screw securely.

Fahnestock Spring Binding Post

IT COSTS NO MORE

on your batteries than the old style screw post.

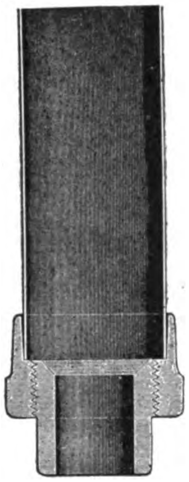
Ask for it.



Send for sample. It's free.

Fahnestock Transmitter Co.

132 Havemeyer Street **Brooklyn, N. Y.**

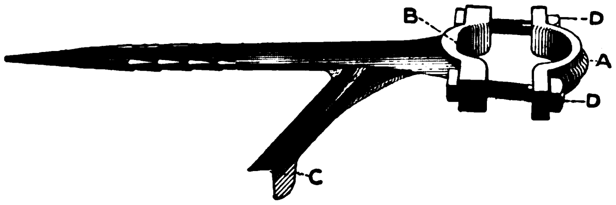


NOVELTY POT HEADS do

cut out wiped joints and **do** save you money at 40 per cent. from list.

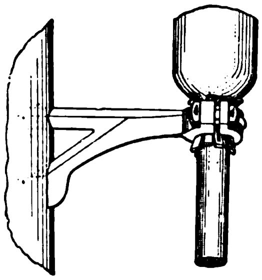
SECURITY POTHEAD BRACKETS

at sixty-five cents net each **are** cheaper than wooden

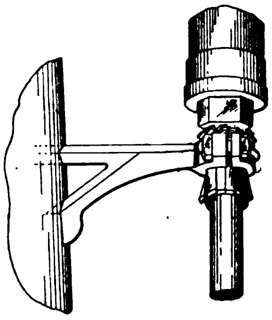


blocks, and they don't break down while the pole lasts.

What does a wooden block cost you and how long does it last?



Bracket in Position.
Old Style Pothead.



Bracket in Position.
"Novelty" Pothead.

This is the way they look.

NOVELTY SLEEVE AND THREE-WAY BRANCH

No wiped joints. Do it with a torch and soldering iron.

Price 40 per cent. from list.

Send for Catalog 125.

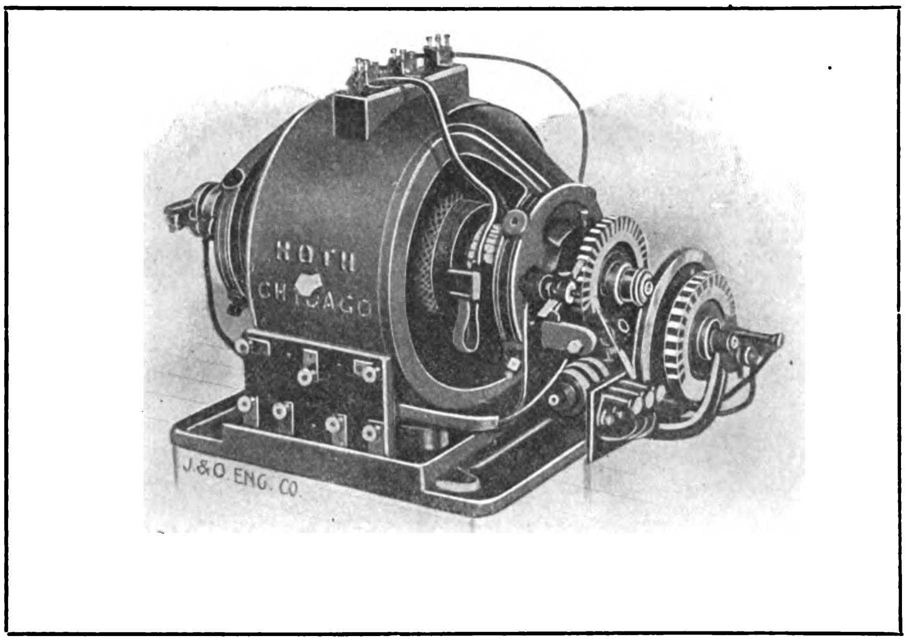
THE F. BISSELL COMPANY.
MANUFACTURERS
TOLEDO, O.

Trade
Mark

IN THE MANUFACTURING FIELD
"SUCCESS LIES IN THE KNOWLEDGE OF OUR TOOLS."

RINGING GENERATOR WITH HOWLER AND BUSY SIGNAL ATTACHMENTS.

ROTH BROS. CO., Chicago, has placed on the market a type of ringing generator that has several points of interest. Besides furnishing ringing current it is designed to give howler or busy signals as well as to furnish periodic ringing signals. This machine is designed for use when direct current power circuits are not available, a pulley being provided so that it can be driven from any source of power at hand. If a motor of suitable size and speed is employed the generator can be directly coupled on an iron sub-base, the machines, however, being insulated from each other. This ringing generator is self-exciting, having a direct current winding to excite the fields and also to generate the alternating current. Ordinarily the winding is such as to give the proper voltage for ringing purposes only when driven by a motor, but the generator can be arranged to run from a storage battery if so desired.



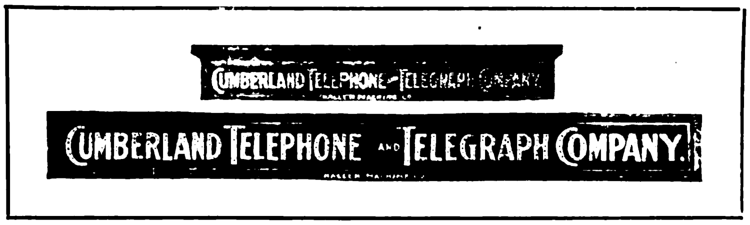
Ringing Generator with Howler, Busy Signal, and Periodic Ringing Attachment. Manufactured by Roth Bros. & Co., Chicago.

In cases where it is necessary to have a higher voltage to ring over long toll lines the company is prepared to wind these machines for two or more entirely independent voltages.

The mechanical construction is such and the balance is so perfect that the machine is said to run without any noise.

The commutators and interruptors for signaling purposes have received a great deal of care in design and construction and are said to fulfil their duty with the minimum attention.

This type instrument is fully described, together with prices, in Bulletins 150 and 151, which the company has ready for distributon.


CUMBERLAND TELEPHONE AND TELEGRAPH COMPANY
CUMBERLAND TELEPHONE AND TELEGRAPH COMPANY.

Transparent Jewelled Electric Sign. Manufactured by the sign works of the Haller Machine Company, Chicago.

THE F. BISSELL COMPANY, Toledo, Ohio, has completed shipment of the poles for the Van Wert, Ft. Wayne, extension of the Ft. Wayne, Van Wert and Lima Traction Company. The order called for 2,000 40-foot 7-inch poles, which were shipped in less than three weeks. The company has also filled large orders for Idaho poles at Ft. Wayne and Middletown, Ind.; Hamilton and Findlay, Ohio, besides a score of important orders for Michigan poles.

THE UNITED ELECTRICAL MFG. CO., 53 Vesey street, New York, has recently placed on the market the Autoplex dry battery. This cell is the result of a long series of experiments by H. C. Martin, a well-known inventor in the electrical field, and embodies new principles in battery design. The company will be pleased to quote prices and give further information upon request.

NOVEL TRANSPARENT SIGNS.

FOR a telephone company which desires to be ever before the public no better scheme of publicity can be employed than by the use of attractive signs. Especially is this true of companies which have to meet competition. The subject of sign design has recently received a large amount of attention and new ideas have been evolved which possess more than ordinary merit. A firm which has very successfully solved many of the problems of electric sign devices is the Haller Machine Company, of Chicago. One of its latest productions is a transparent sign, herewith illustrated. The name of the company is depicted in white letters and is outlined in gold and studded with jewels. As the background is black and the electric lamps are placed inside the sign casing the letters stand out with remarkable clearness and form an attractive picture not easily to be forgotten.

These signs are used by a number of the larger companies as standard hotel switchboard and booth signs, but they are equally as well adapted for other purposes. The company requests all parties interested to write for further information and its bulletins, which will be sent upon request.

THE GORDON BATTERY COMPANY, New York, has ready for distribution a catalogue which fully describes the Gordon cell and includes price lists for each type and requisite supplies.

Ten different styles are listed which are guaranteed to give from 100 to 1,000 ampere hours. These cells are intended to take the place of storage batteries where it is impracticable to operate the latter and have in consequence a number of advantages not possessed by other makes. For small central energy system,

Monarch Electric and Wire Co.

125-127 So. Clinton St., Chicago

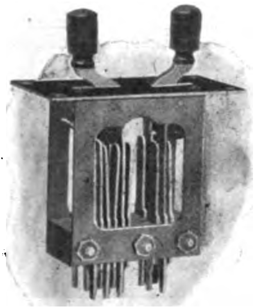
JOBBERS OF

Complete Line Telephone Construction Material

MANUFACTURERS OF

Galvanized Steel Strand and *Weatherproof Line Wire*

We will be located at Room 657, Auditorium Hotel, during Convention, and extend a special invitation to delegates to make this their headquarters during that time.



V-B Specifications

The V-B RINGING and LISTENING KEY is mounted in frame of stamped sheet steel. It rings on either cord. Springs are assembled in rubber blocks, firmly clamped, thus insuring rigidity and strength, keeping the springs firmly in place. Roller and lever bearings are of drill rod. Every part built to wear. Not a bit of metal, not a connection made without counting its efficiency and durability in the make-up of the whole board.

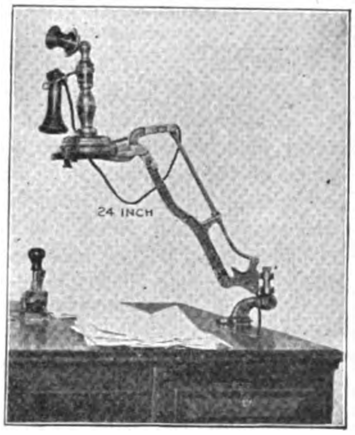
The Vought-Berger Company

Makers of First-Award

Telephones and Switchboards

La Crosse, Wis., U. S. A.

The Equipoise Telephone Holder



improves the telephone service.

It makes the telephone extremely convenient. Keeps it out of the way when not in use, but swings it right around when you want it to any position, any height. For homes as well as business offices.

The *Equipoise* prevents tangling of cords and other telephone troubles. It makes the service better and its great convenience increases the demand for extension sets.

For two different telephone systems, a special yoke carries the two different Equipoise Holders on one pivot.

Easily fastened by any one to desk, table, wall, floor —anywhere you want to put it.

Made in five sizes—18, 24, 30, 36 and 42 inches. All swing around in a 4-inch radius.

Write for booklet and full information.

Liberal Commissions to telephone men and electrical supply houses.

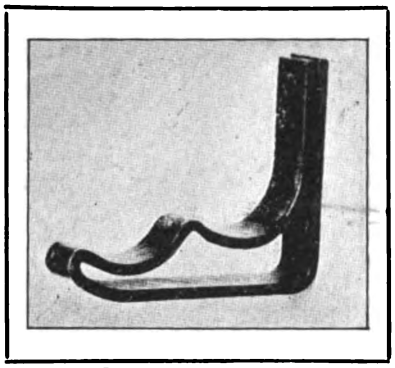
Oliver Mfg. Co.

1014 Drexel Bldg. **Philadelphia**

switchboard transmitters, pole changers and apparatus requiring constant current the manufacturers claim this battery to be particularly efficient. They are for sale by all dealers or manufacturers or can be purchased direct. The catalogue will be gladly furnished upon request.

NEW IDEAS IN CONSTRUCTION MATERIAL.

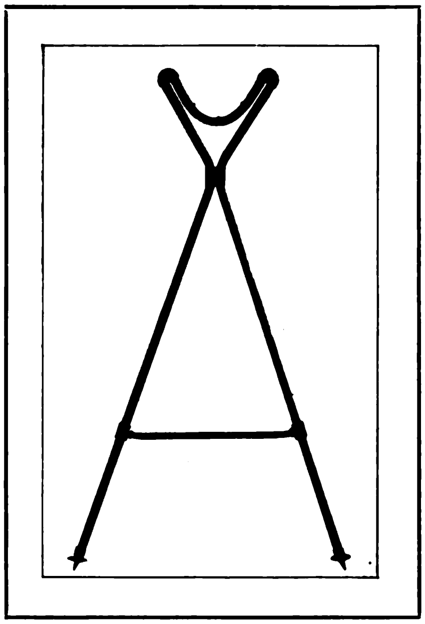
CONSTRUCTION material at the best does not offer much opportunity for inventive ability or novel design. Therefore the new designs of two very important adjuncts to the building of aerial and underground lines which are herewith illustrated may prove of interest. The Hallett Iron Works, 92-96 West Polk street, Chicago, has recently issued a catalogue describing its varied line of construction supplies in which the manhole cable rest and pole crutch are described. The cable rest is designed to support cables where needed and not on the line of a fixed standard which the cable cannot be made to reach. These supports are made in four sizes to hold one, two, three or four cables, a single lag screw sufficing to hold the smaller sizes to the wall or an expansion bolt for the largest.



Manhole Cable Rest. Manufactured by Hallet Iron Works, Chicago. This rest is made in four different styles to take from one to four cables.

The Hallett pole crutch is lighter than the ordinary home-made wooden one and it is absolutely safe. The legs are braced with a cross tie, which greatly adds to the rigidity of the device, and the ends of the supports are provided with guard stops to prevent the points sinking too far into the ground.

The Hallett Company will be pleased to hear from parties interested and will mail the descriptive catalogue upon request.



New Type Hallet Pole Crutch, or Dead Man.

The Century Telephone Construction Company, of Buffalo, N. Y., is having an exceedingly busy season and is shipping many switchboards and telephones to all parts of the country. It reports an ever increasing demand for magneto telephones and outside cable heads. It has just received orders from the following companies for switchboards: The Livingston County Telephone Company, Groveland, N. Y.; The Livingston Rural Telephone Company, Livingston, N. Y.; Southern Cayuga Telephone Company, Poplar Ridge, N. Y., and private branch exchange switchboard for the Frontier Telephone Company, of Buffalo, N. Y., and a toll switchboard for Wellsville Telephone Company, Wellsville, N. Y. It will also increase the switchboard in the exchange of the Penn Yan Telephone Company, Penn Yan, N. Y. The present switchboard in Penn Yan is a common battery lamp signal switchboard, built and constructed by the Century Telephone Construction Company about three years ago. It has just shipped a 600 line common battery lamp signal switchboard to Princeton, Ind., which will be installed during the present month.

The Appleton Electric Company, Chicago, is distributing Bulletin No. 2, which very thoroughly covers protection apparatus, fuses, fuse blocks, etc.; test connectors, cable hangers, wire connecting sleeves, the Appleton gas burner and soldering iron and several other pieces of construction material. The major portion of the catalogue is devoted to fuses which this company manufactures in any capacity from 1/8 up to 500 amperes. Prices, with full information as to capacity and size, are quoted, as well as tables which give the best length for use of the different fuse wires. This is an important item and should be known by all parties having to install or replace fuses. Lightning arrestors having glass enclosed as well as the ordinary type fuses are described at length, particular attention being drawn to the fact that the glass enclosed fuses offer immediate identification when burnt out by the discoloration of the glass envelope.

Multiple fuse block arresters, together with different forms of distributing boards are illustrated. In every case each piece of apparatus being accompanied by list price. To all parties interested the company will be pleased to send this catalogue and to give any further information desired.

PAY STATION SPECIFICATIONS.

THE Gray Telephone Pay Station Company, Hartford, Conn., has recently printed a complete set of specifications covering equipment of toll stations, with automatic coin collectors, together with such data as will be found useful in selecting and ordering the same. These specifications are confined entirely to the cabinet sets, as the company considers its regular catalogue fully covers the one, two and three coin types.

Illustrations are shown of seven different types of cabinets, each of which is accompanied by data as to its most desirable use, space occupied, style of cabinet and price. A remarkably fine engraving of the mechanism is given, together with full particulars as to its operation. On the whole the specifications show a large amount of care and artistic merit in their design and should prove valuable to all companies having use for such apparatus.

W. N. Matthews & Bro., 219 North Second street, St. Louis, are sending out another of their interesting display cards calling attention to the merits of the Stombaugh guy anchor. Under the title of "Relieves the Strain" the reading matter points out; (if you have been under a strain; because your guying devices have failed to hold) the merits of the Stombaugh anchor. The firm will prepay freight on first shipment of as many anchors as desired and will take them back without any expense of freight to you if not satisfactory.

The Electric Gas Lighting Company, Boston is distributing a mailing card No. 13, which draws attention to the qualites of its telephone apparatus. The company claims as its ambition, to manufacture telephones with every detail perfect, that will satisfy the user, and which can be sold at a low price consistent with the quality furnished. The apparatus is simple to install and blue-prints are furnished to further aid the installer. The company will be pleased to hear from all parties interested.

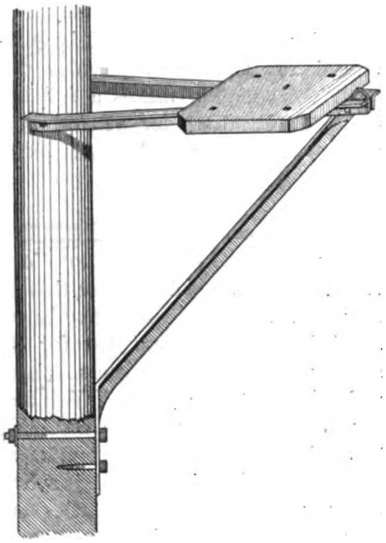
The Automatic Electric Company, Chicago, has had a reprint

We can save you at least 10% on

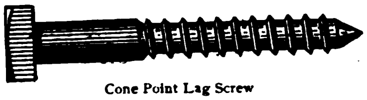
LINE CONSTRUCTION MATERIAL

no matter where you are buying now.

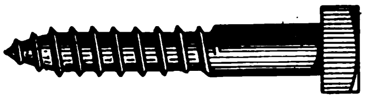
If such a saving is worth your while, write us for quotations.



Pole Seat



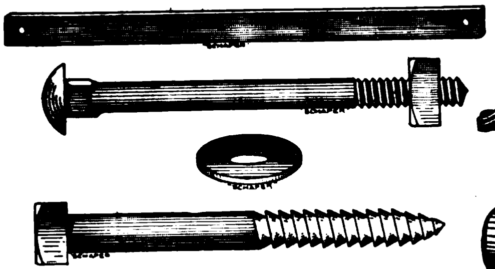
Cone Point Lag Screw



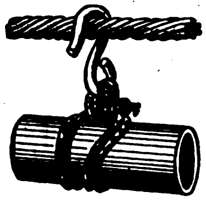
Gimlet Point Lag Screw

Fetter Drive Pole Step

Fetter Drive Screw

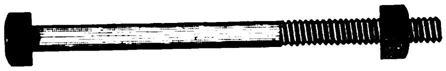


Cross Arm Brace Complete



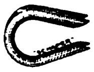
Marlin Cable Hanger

Square Washer



Through Bolt

Guy Rod



Wire Rope Thimble

Write for Free Estimate Blank

SCHAPER CONSTRUCTION MATERIAL CO.,
Electrical Exchange Building, New York City.

We are located on the great

Rock Island System

and are

Behind Time, TOO

We ALSO promise to steam better in the near future (July or August).

The TROUBLE with us IS that Telephone People are finding that

The T. & A.

IS

"THE ONLY WAY"

To handle RURAL LINES.

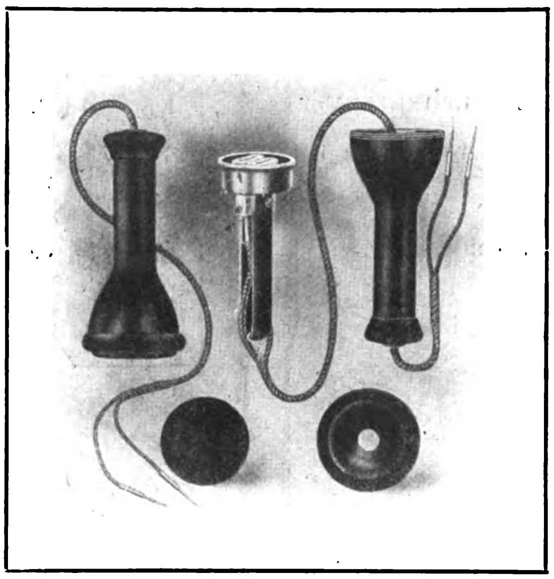
We hope to show our Selective Central Relay and Attachments at the National-Interstate Telephone Association meeting, Chicago, June 21-23. A grounded line equipped "our way" requires merely the substitution of a second line wire in place of the ground connections to change it to a metallic line. New telephones or switchboards are NOT required.

The T. & A. Selective Call Co.,
GENESEO, ILL., U. S. A.

made of an article appearing in the San Francisco *Chronicle*, which tells of the franchise granted to the Home Company of San Francisco. Accompanying the article is a half-tone of an automatic desk stand, which the description states is to be the type of apparatus used. The automatic company has installed several exchanges on the Pacific coast, the principle one being at Los Angeles, for which system it now has orders for apparatus which will make a total of 20,000 instruments.

CONCEALED CONNECTION TYPE RECEIVER.

In the accompanying illustration is shown a new style concealed binding post receiver which is being manufactured by the Williams Telephone and Supply Company, 73-79 Central avenue, Cleveland, Ohio. Its construction is such as to permit easy adjustment, and it is so designed that the interior of the receiver can be drawn from the shell and connection made to it without changing the adjustment. The permanent magnets are made from the same grade of steel that is used in the company's generator magnets, which gives a strong magnetic field and makes the receiver extremely sensitive. Its construction differs somewhat from the majority of receivers on the market, in that connection can be made to it with any common receiver cord. This is of special advantage, as it is not always possible to get a special tipped cord. The company has several interesting circulars which it will be pleased to send to inquirers and will gladly furnish all information relative to its goods upon request.

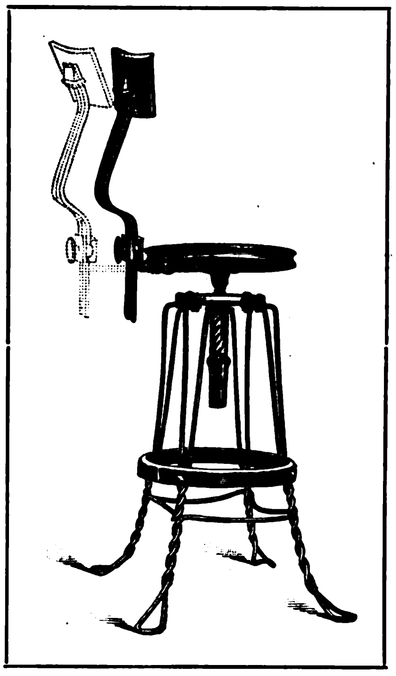


New Type Bi-polar Receiver. Made by Williams Telephone and Supply Company, Cleveland, Ohio.

The Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., report having closed contracts for switchboards for the following places: Mt. Branch, Tenn.; Berwick, Pa.; Fulton, Kan.; Fenton, Ia.; Bowbells, N. D.; Folsomdale, Ky.; East Smithfield, Pa.; Elizabeth, N. C.; Washington, N. C.; Granville, N. D.; Pontiac, Ill.; Macon, Ill.; Chicago, Ill.; Fulton, Ia.

AN OPERATOR'S CHAIR.

An operator's chair designed along entirely new lines is being placed on the market by the A. H. Andrew's Company, metal furniture manufacturers, 174-176 Wabash avenue, Chicago, Ill. As will appear from an examination of the accompanying illustration, several excellent features are incorporated in its make up which greatly differ from the ordinary idea. The framework is made from Bessemer steel rods, twisted and interwoven into rigid form. The woodwork can be supplied in either oak or birch or mahogany finish if preferred. All the metal work is beautifully plated and given a Japanese copper finish. Attention is drawn to the adjustable curved spring back and seat which insure the maximum comfort for the operators, as they can be arranged to meet their individual requirements. The foot rest being metal, cannot be worn through, nor will the chair loose any of its rigidity from constant use. The manufacturers claim on account of the construction a cleaner and more satisfactory chair than any other on the market, there being no parts which are liable to injury from misuse or other causes. This chair is made in two heights, 24 inch and 28 inch, and is guaranteed for ten years. Besides this chair the company makes a full line of metal furniture for general purposes. Catalogues and other information will be furnished upon request.



New Design in Metal of Operator's Chair. Made by the A. H. Andrews Co., 174 Wabash Ave., Chicago, Ill.

The Moon Manufacturing Company, Chicago, Ill., announces that its new and improved cable appliances are being generally adopted for installing cable with sleeveless splices and without "wipe joints." A number of large exchanges are installing "all cable plants," using Moon combination terminal heads and junction boxes, and innumerable smaller orders from all parts of this and some foreign countries demonstrate that the manner of forming cable splices and of "tapping out" cable wires which this apparatus permits, has marked a new era in cable construction.

"It has been a short but decisive education campaign," the Moon Manufacturing Company state. "Even the most conservative have been obliged to admit the many advantages of this form of apparatus, and that the cable joints thus formed are more substantial and reliable than can be formed by old methods."

The T. & A. Selective Call Company, Geneseo, Ill., says that one of its greatest difficulties has been in convincing rural telephone managers that this system is efficient under very bad conditions of lines and that it really has the labor saving advantages claimed for it. In sections where the system has been installed and thoroughly tried, the company finds it a very easy matter to do business with other companies that have seen the system in operation.

The F. Bissell Company, Toledo, Ohio, has just issued its Security Specialty Catalogue, which very fully covers in detail a number of devices for telephone construction work which are thoroughly practical and sold at a moderate figure. In applying for this catalogue, which will be mailed upon request, it is suggested that parties interested ask for a set of this company's complete estimate blanks. These blanks are so designed as to greatly reduce the labor incident to estimating upon new work. As both catalogue and blanks are free, it is expected that a number of companies will avail themselves of this opportunity to get in touch with the Security Specialties manufactured by this firm, and also to be placed on its mailing list for future publications.

HALLETT IRON SPECIALTIES ARE THE BEST

The Hallett Company was one of the very first concerns in the country to make a specialty of iron goods for the use of telephone and telegraph companies.

Our long acquaintance with practical construction men has made it possible for us to perfect the designs of the articles we manufacture. Our methods of forging, punching, galvanizing, etc., have each been selected in reference to meeting high grade specification requirements.

We guarantee the material and workmanship of each piece we make and will gladly replace goods faulty in either of these respects.

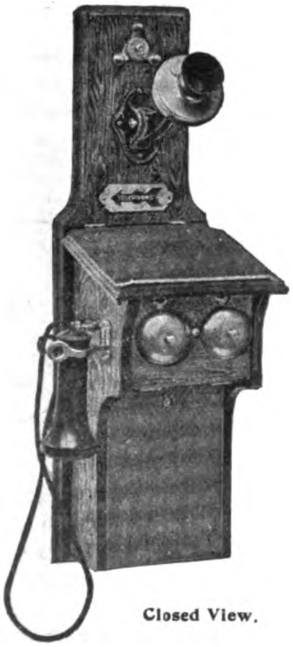
READ THIS: **Our Latest Catalogue contains beautiful illustrations of our telephone specialties. It will enable you to select the devices adapted to your requirements. It's free on request.**

THE HALLETT IRON WORKS

92-96 WEST POLK ST. **CHICAGO, ILL.**

GET IN LINE ON UP TO DATE APPARATUS

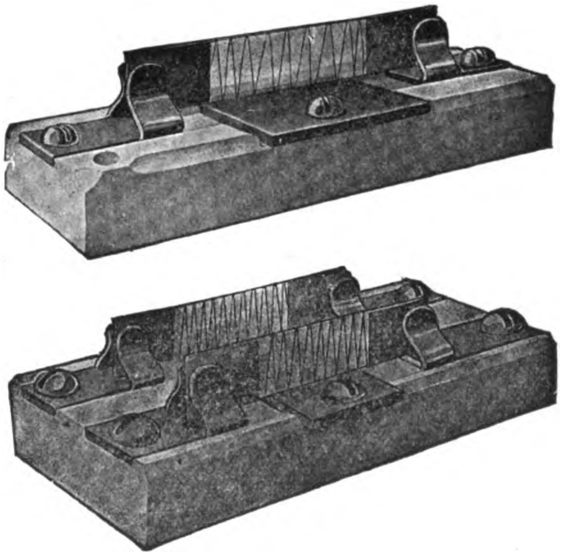
If you order Central "Leader Junior" Telephones you will be buying now what you are sure to buy ten years from to-day.

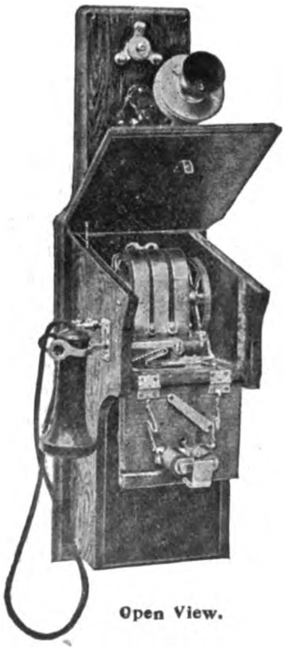


Closed View.

CENTRAL FUSE BLOCK

LIGHTNING ARRESTERS





Open View.

Sample Series—4 Bar or 5 Bar Bridging Leader Junior Telephone shipped to any responsible party in the United States on 30 days' trial prepaid freight.

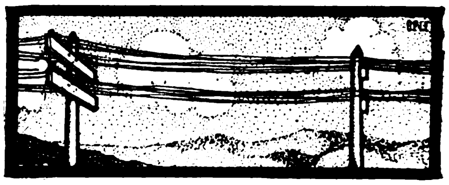
Sample Fuse Block as above sent free on request to any one mentioning this ad.

CENTRAL TELEPHONE & ELECTRIC CO.

2135 Lucas Ave., St. Louis, U. S. A.

QUERIES

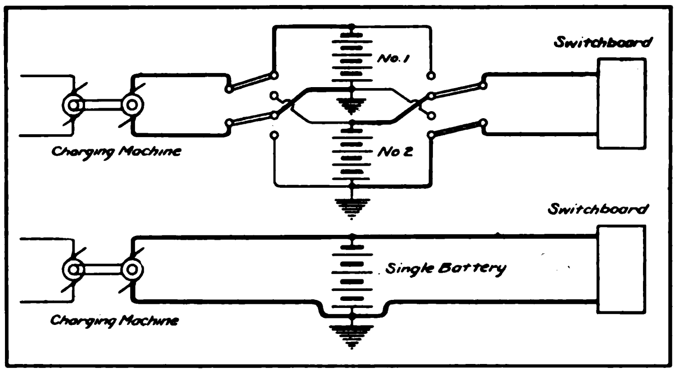
Questions on any subject relating to telephony will be answered on this page.



STORAGE BATTERY CHARGING.—(566.)

Will you show a diagram showing method generally used for charging a set of storage batteries? W. H. M.

Fig. 566B shows a diagram of the accepted method of connecting a power circuit for charging an exchange storage battery. The primary power can be either direct current or alternating current, the motor of the charging machine being designed to operate from it. The generator end of this charging machine should be so designed as to not cause noise in the telephone circuits when charging the battery, thus allowing the battery to be charged while it is connected to the switchboard. There are several advantages to be derived from such a condition. To begin with a single set of storage batteries can be used and the original cost and maintenance expense of a duplicate set done away with. The cost of operation will thus be greatly reduced, for when two sets of storage batteries are used, as shown in Fig. 566B, one set is charged while the other is connected to the switchboard, thereby causing a low equivalent to the efficiency of the battery. If it is possible to obtain 60 per cent of the energy stored in the battery then 40 per cent will be lost by charging one battery while discharging from the other. Fig. 566C shows the single battery connection. Here the charging machine virtually furnishes current direct to the switchboard without any loss, the storage battery being bridged across the circuit so as to be charged at the same time. When this arrangement is used the charging machine is run during the portion of the day when the greatest load is on the switchboard, so that with the addition of the storage battery load enough current will be taken from the generator to cause it to operate at somewhere near the highest efficiency. This increase in efficiency of the charging machine will, in a properly designed power plant, go a long way in supplying the necessary extra current for charging the storage battery, so that when the load is light on the switchboard the machine can be stopped and the storage battery allowed to furnish all operating current until discharged. Furthermore, the deterioration of a storage battery is rather rapid, so that it is far better to have one set which will operate the exchange for 24 to 36 hours. Then at a future date, when this set has become inefficient, replace such parts as are defective and thereby obtain twice the length of life of the original two sets and at a less cost. In every case it is better to have a duplicate charging set, and if possible have it operated from a second source of primary power. When one set of batteries is used the connections of these charging sets should be similar to Fig. 566D. If the charging generators are properly constructed and properly connected to the circuits, current can be furnished to the switchboard direct in case of accident to the storage battery, thus fully providing for every contingency.



Figs. 566B and C.

DROP BETWEEN LINE AND GROUND.—(567.)

We have a line paralleling a 500-volt street railway circuit for about seven miles and wish to install, at the end of this line, a circuit such as you recently described in your columns, namely, a switchboard drop with drop bridged to ground from one side of the line only. Will this unbalance the line enough to make our telephone line noisy? Most of the way, our wires are on the same pole with a trolley feeder. F. E. B.

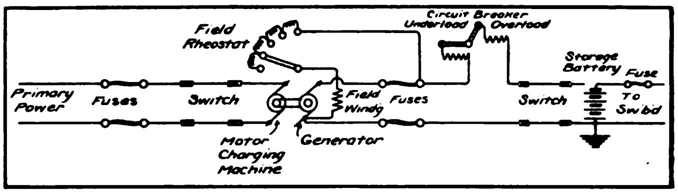


Fig. 566A.

This is quite likely to make your line noisy. The safest procedure will be to install a dummy drop connected from the other wire to ground, in order to balance the line. Install a condenser in series with the drop—one in series with each—in order to prevent leakage currents from operating the drop.

STORAGE BATTERY PLATES—TELEPHONE REPLATER.—(568.)

Does it take any more voltage to overcome the resistance in charging a storage cell having 7 plate elements than one having 105 plate elements, such as the type T of the Gould battery?

Are electro chemical formed plates better than pasted plates for all-round use, such as isolated lighting and furnishing current for private central energy telephones?

Which is the best telephone repeater on the market, and are they used very much? M. C. F.

The same voltage (pressure) will suffice to charge the 105-plate cells as the 7-plate cells, but the charging source should have a correspondingly greater available supply of current to charge the former, i. e., with an unlimited supply of current the storage cells can be of any size or have any number of plates and be charged with the same voltage.

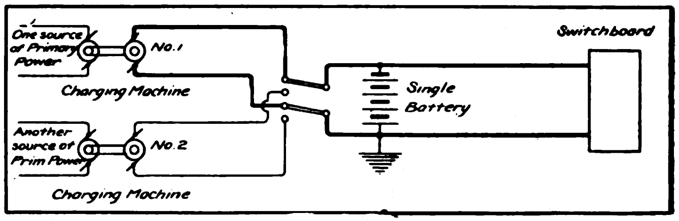


Fig. 566D.

The latest design of storage battery for lighting and telephone service employs a formed positive and a pasted negative plate. The active element or paste of the negative plate is held in small perforated capsules which are clamped in the grid, thus preventing rapid deterioration.

A telephone repeater for augmenting the voice currents or relaying them as in the case of telegraph signals has not as yet become a commercial article. Several very good instruments have been devised which are limited in action by only working in one direction, and for that reason are not commercial. It is probably safe to say that there are no telephone repeaters in use on long distance lines at this date.

Kellogg Switchboard and Supply Co.

CHICAGO, ILL.

Wholesalers of **Michigan White Cedar** **POLES** *of* **QUALITY**

Five Yards *Prompt Shipments*

PITTSBURG & LAKE SUPERIOR IRON CO.,

ESCANABA, MICHIGAN.

PRODUCERS and WHOLESALERS

WE always carry a large stock of all sizes of White Cedar Poles, and having yards on all principal railroads in Northern Michigan and Minnesota, are in position to make immediate shipment.

"From the Stump to the Line."

OUR STOCK OF

CEDAR POLES

Is very large at present. They are straight, sound and strong. Particularly well adapted for

Telephone Lines

We have them in assorted sizes and at prices that will certainly suit

Write us now for quotations

Sand Point Cedar Co.

SAND POINT, IDAHO

WHITE CEDAR POLES

We can furnish anything in White or Idaho Cedar Poles, and it won't cost you anything to get our prices. Write us.

PAGE & HILL CO.

LUMBER EXCHANGE MINNEAPOLIS, MINN.

Cedar Telephone Poles

THOROUGHLY SEASONED,
ANY LENGTH OR SIZE,
IMMEDIATE SHIPMENT,
SEVEN DISTRIBUTING YARDS,
FORTY YEARS EXPERIENCE

MAIN OFFICE:

1211-12-13 Marquette Bldg., CHICAGO

Wm. Mueller Company

THE WEEK'S MESSAGES

FINANCIAL.

SANDWICH, ILL.—The Northern Illinois Telephone Company has increased its capital stock to $25,000.

LAINGSBURG, MICH.—The Laingsburg Telephone Company, of Laingsburg, has increased its capital stock from $25,000 to $100,000.

MINNEAPOLIS, MINN.—The Tri-State Telephone and Telegraph Company, has declared the eighth quarterly dividend of 1½ per cent. on the preferred capital stock.

BRADSHAW, NEB.—The Bradshaw Telephone Company has increased its capital stock to $50,000.

CROOKSVILLE, O.—The Crooksville Telephone Company, Crooksville, O., has increased its capital from $10,000 to $25,000.

WELLINGTON, O.—The Wellington Telephone Company has increased its capital stock from $20,000 to $30,000.

CANYON CITY, TEXAS.—The Northwest Texas Telephone Company, of Canyon City, has increased its capital stock from $10,000 to $20,000.

CASCO, WIS.—The Casco and Brussells Telephone Company has increased its capital stock to $3,000.

FRANCHISES.

MARSHALL, ARK.—The Marshall town council has granted a franchise for a telephone system to M. B. Storment.

SAN DIEGO, CAL.—The Home Telephone Company has applied for a franchise in San Diego.

BARTONVILLE, ILL.—The Bartonville Telephone Village Board is considering an application for franchise from the Interstate Telephone Company, which will probably be granted.

BATESVILLE, IND.—The Decatur County Independent Telephone Company has applied for a franchise in this city.

WILLIAMSBURG, MASS.—The Citizens' Independent Telephone Company, which was recently granted a franchise, will begin construction work in about a month's time.

NEW YORK, N. Y.—Application was made to the Board of Estimate and Apportionment of New York City recently, by the Atlantic Telephone Company, for a franchise to establish an Independent telephone system throughout Greater New York. The capital is given as $25,000,000. The application has been signed by Arthur B. LaFar and James A. Campbell, 30 Broad street, as counsel and directors.

SPOKANE, WASH.—The Home Telephone and Telegraph Company has applied to the City Council for a franchise to install a telephone system in Spokane.

EVERETT, WASH.—The franchise desired by the Mutual Telephone Company will in all probability be granted at a very early date.

ELECTIONS.

TREMONT, ILL.—The Tazewell County Telephone Company recently elected the following officers: H. L. Schmultz, president; Fred. Reuling, vice-president; George Bird, secretary and treasurer; William Mosehal, general manager.

WILIMAR, MINN.—At a meeting of the Minnesota Central Telephone Company the following officers were elected, viz.: President and treasurer, D. N. Tallman; vice-president, J. L. Schoch; secretary, John Williams. The company will expend $75,000 this year.

LINCOLN, NEB.—The Lincoln Telephone Company has elected the following officers: President, F. H. Woods; vice-president, A. W. Field; secretary and treasurer, W. E. Sharp.

LINCOLN, NEB.—The Lincoln Telephone Company has elected the following officers: President, F. H. Wood; vice-president, A. W. Field; secretary and treasurer, W. E. Sharp.

UNDERGROUND.

SHELBYVILLE, IND.—The Mutual Telephone Company of this city will advertise for bids for the construction of a complete underground system and equipment. The wires to be laid will have a capacity of 4,800 telephones.

LEAVENWORTH, KAN.—The Peoples' Telephone Company will soon begin the erection of its new telephone exchange and the installation of its underground central energy system. This work will cost in the neighborhood of $100,000.

NEW COMPANIES.

BENTONVILLE, ARK.—The Farmers' Rural Telephone Company has been organized.

BIG PINE, CAL.—The Big Pine, Lida and Tule Canyon Telephone and Transportation Company has been incorporated. The directors and principal shareholders are: J. M. Davis, of Los Angeles; J. W. Tracy, Big Pine, and others.

LANCASTER, N. B., CANADA.—The Fairville Electric Light Company has been incorporated to construct and operate a telephone system. Capital $25,000. Address James Ready, L. Ready or M. Ready, of Lancaster.

MAYNOOTH, ONTARIO, CANADA.—The Peoples' Telephone and Telegraph Company has been incorporated with a capital of $40,000.

MELITA, MANITOBA, CANADA.—The Melita Telephone Company has been incorporated to construct lines throughout Arthur. Address Duncan Day, G. Coulter, of Melita.

RUSSELL, MANITOBA, CANADA.—A company has been organized at Russell under the name of the Russell Telephone Company, to operate in Shell River, Russell, Boulton and Silver Creek. Address Albert Gale, J. Doig, or J. J. Moon, of Russell, Manitoba.

WEST PALM BEACH, FLA.—The Interurban Telephone Company has been incorpoarted with a capital stock of $25,000 to construct and operate a telephone system to Miami, Fla., in the county of Dade.

MOVILLE, IA.—West End Toll Line Company, of Moville, has been incorporated with a capital stock of $25,000 by S. E. Sibley and others.

ALVORD, IOWA.—The Cleveland Township Telephone Company has been incorporated with a capital stock of $700. Frank Donnelly and others incorporators.

ALVORD, IOWA.—The Alvord Telephone Company has been incorporated with a capital stock of $500; August Berg and others incorporators.

BREMER, IOWA.—The Bremer and Black Hawk Mutual Telephone Association has been incorporated with a capital stock of $10,000. D. G. Bremer and others incorporators.

MILO, IOWA.—The Milo and Sandyville Telephone Company has been incorporated with a capital stock of $1,000. President, C. F. Spurgin; secretary, E. C. Polson.

MASSENA, IOWA.—The Massena Independent Telephone Company has been incorporated with a capital stock of $10,000.

KEWANEE, ILL.—Mr. F. M. Ashe, of the Home Telephone Company, is perfecting arrangements for the organization of the Kewanee Long Distance Telephone and Telegraph Company.

ROBINSON, ILL.—The Citizens' Mutual Telephone Company, of Robinson, has been incorporated with a capital stock of $2,400. Incorporators: M. D. Mills, A. N. Link and W. S. Smith.

ROUND KNOB, ILL.—The Massa County Mutual Telephone Company, Round Knob, has been incorporated with a capital stock of $2,490. Incorporators: George Verbarg, Chris. Korte and C. S. Adkins.

PLAINVILLE, IND.—The Plainville Telephone Company has been incorporated with a capital stock of $2,500 to construct a telephone system in Plainville, and throughout Daviss County. Directors: N. E. Killion, Thomas Bennington and J. H. Russell.

HARPER, KAN.—The Western Rural Telephone Company, of Harper, has been incorporated with a capital stock of $600.

COLUMBUS, KAN.—The Columbus Local Telephone Company, branch of the Cherokee County Mutual Telephone Company, Columbus, has been incorporated with a capital stock of $6,000.

MARVIN, KAN.—The Citizens' Telephone Company, Marvin, Kan., has been incorporated with a capital stock of $1,000.

RIVERDALE, KAN.—The Riverdale Mutual Telephone Company has been incorporated with a capital stock of $5,000.

ST. JOHN, KAN.—Greenridge Mutual Telephone Company, St. John, has been incorporated with a capital stock of $12,000.

CHELSEA, MICH.—The Chelsea and Francisco Telephone Company has been incorporated with a capital stock of $2,000.

LANSING, MICH.—The Michigan Independent Telephone Company has filed articles of incorporation with the Secretary of State at Lansing. The capital stock was fixed at $100. The stockholders of the company are employees of the Citizens' Telephone Company, of Grand Rapids. J. B. Lockwood, president; F. S. Parke, secretary; F. C. Hughes, treasurer, all of Grand Rapids.

MINNEISKA, MINN.—The Valley Telephone Company, Minneiska, Wabash County, has been incorporated with a capital stock of $5,000.

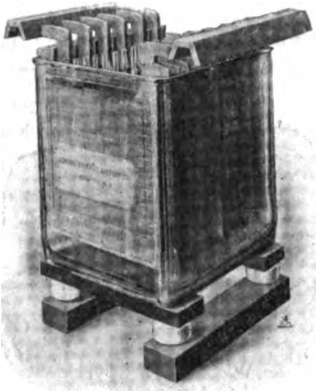
NOVELTY, MO.—A co-operative telephone company has been organized at Novelty with a capital stock of $500.

IF YOU WANT

A Battery that's Properly Made
An Equipment that's Properly Designed
Work that's Properly Executed

WE FURNISH IT

GENERAL STORAGE BATTERY CO.
42 BROADWAY NEW YORK

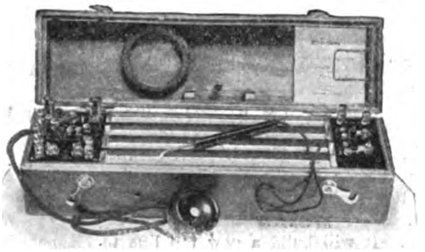


THE UNIVERSAL
Ohmmeter and Faradmeter

Measures resistance to 2 megohms, capacity to 20 M.F.'s; locates "crosses" and "grounds" by "loop" methods, "opens" by capacity methods; does a lot of other telephone tests.

Owing to the large demand we are now putting through these instruments in quantity and announce a

REDUCTION IN PRICE (Circular 527 A)



Universal Ohmmeter and Faradmeter.

We make a full line of Test Sets.

See Catalog 500 A and Circular 500 AA

Our JR. WESTERN UNION SET

is the newest, most compact, and most complete "Decade" Set on the market.

HEADQUARTERS FOR MEASURING INSTRUMENTS OF ALL KINDS

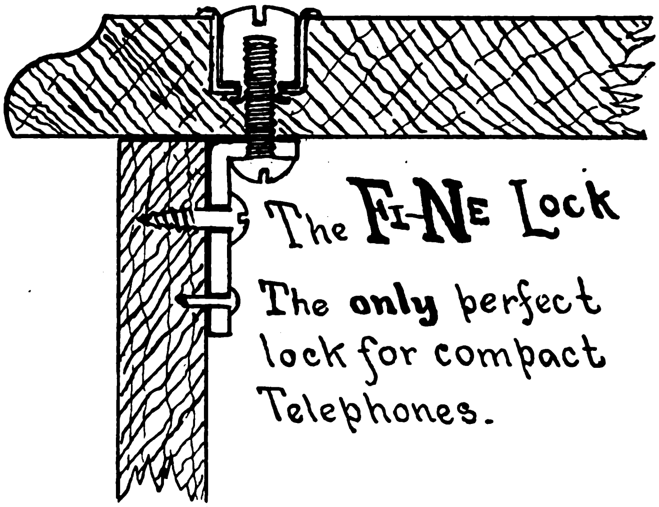
GET ON OUR MAILING LIST

Address Telephone Department

The Willyoung & Gibson Co.
38 W. 13th St., New York City

The Biggest Little Thing

we ever got up is


The FI-NE Lock
The only perfect lock for compact Telephones.

Specify the FI-NE LOCK
even tho' you order "other fellows" Phones

Other BIG THINGS are our FI-NE GENERATOR
FI-NE TUBULAR DROP

In fact ALL OUR STUFF IS FI-NE

FISK-NEWHALL TELEPHONE MFG. CO.
Chicago

The Simplex Relay Switch Board
ESPECIALLY FOR
RURAL INSTALLATIONS

May be higher in price than others, but the difference becomes profit by saving in operation.
Correspondence invited with interested parties.
Sample to be on exhibition at Chicago Convention in June.

THE WILLIAMS TELEPONE & SUPPLY CO.
59 CENTRAL AVENUE, CLEVELAND, OHIO

HOLLAND, O.—The Holland Home Telephone Company, Holland, Lucas County, has been incorporated with a capital stock of $5,000. Incorporators: Harry W. Lloyd, E. C. Hampton, J. A. Belford and others.

PERRY, OHIO.—The Chestnut Ridge Telephone Company has been organized. Albert Swinehart, president; Charles Davidson, vice-president; Albert Butterfield, secretary.

LAFOLLETTE, TENN.—The Lafollette Water, Light and Telephone Company has been incorporated with a capital stock of $150,000. Incorporators: N. C. Hubbard, J. P. Achenz and Frank Cox, of Wheeling, Va.

TEHAUCANA, TEX.—The Peoples' Telephone Company, of Tehaucana, has been incorporated with a capital stock of $2,500. Incorporattors: Joe Peoples, Julius Desenberg and O. L. Collins.

PALMYRA, VA.—The Virginia Central Telephone Company, Palmyra, has been incorporated with a capital stock of $5,000. C. E. Jones, president, Carysbrook; L. O. Haden, secretary, Palmyra; W. Sclater, treasurer, Palmyra.

RUTLAND, VT.—The Rutland County Telephone and Telegraph Company, of Rutland, has been incorporated with a capital stock of $10,000.

LUSK, WYO.—The Rawhide Telephone Company, of Lusk, has been incorporated with a capital stock of $5,000. J. W. Agner, president; H. C. Snyder, secretary, and William Reynolds, treasurer.

BRIDGEPORT, W. VA.—The Bridgeport Telephone and Telegraph Company was organized at the Oak Grove School House, one and one-half miles east of Bridgeport. K. Thompson, president; A. J. Williams, secretary and treasurer, and Newton Brooks, general manager.

PERSONAL.

J. T. HALDEN has resigned his position as manager for the Cumberland Telephone Company, at Princeton, Indiana, and is to be succeeded by a Mr. Byers of Evansville.

H. LYON has been appointed manager of the Muskogee, I. T., exchange of the Pioneer Telephone and Telegraph Company to succeed G. F. Hardwicke, who has been promoted to a division superintendency.

C. R. BURNTON, of Fond du Lac, Wis., has been appointed local manager for the Wisconsin Telephone Company, succeeding L. G. Barnes, who has been promoted to the office of district manager for the company.

E. M. O'BRIEN, manager of the Des Moines, Iowa, Bell exchange, has resigned. He will remain in Des Moines and engage in business. E. T. Thompson, who has been manager for the company at Boone, has been appointed to succeed Mr. O'Brien.

G. C. CARPENTER, of Findlay, Ohio, has been appointed manager of the local telephone company at Jacksonville, Ill., to succeed J. P. Brown, resigned.

SAMUEL D. HASTINGS, JR., has been appointed manager of the office of the Wisconsin Telephone Company at Green Bay.

HARRY L. McNEAL is the new assistant superintendent of the York, Pa., telephone lines. He will have charge of the office work of the company.

F. R. LEE, formerly of Fort Worth, Tex., is the new manager of the Southwestern Telephone Exchange in Belton. He takes the place of Mr. J. T. Bramlett, who recently resigned.

C. S. MULHERRON has resigned as manager of the exchange at Newport, Ark., and is succeeded by W. F. Howard.

WILLIAM C. HENDRICKS, who for many years has been manager for the Sunset Telephone and Telegraph Company in Sacramento, Cal., has been promoted to the position of district manager for the northern part of California and the State of Nevada, with headquarters in Sacramento.

New Construction in the Field

SAN BERNARDINO, CAL.—Nathan W. Tarr, recently granted a franchise between desert points, has applied for a new franchise and intends to build lines over the whole desert.

TERRIL, GA.—The Terril Co-Operative Telephone Company will install a local exchange.

PARIS, ILL.—The Wabash Valley Telephone Company is to spend $75,000 in improvements.

ROCKFORD, ILL.—The Rockford and Interurban Telephone Company expects to build a line to Belvidere and a line to Beloit.

WABASH, IND.—The Home Telephone Company will shortly ask for bids upon the construction of a new and modern exchange building. Bids for equipment will be received later.

ELKHART, IND.—The Home Telephone Company has voted to place three new copper lines in service between Elkhart and Goshen. The expense of the improvements will be $4,700.

OTIS, MASS.—Otis is to have a new telephone line, from the Greenwater pond terminus of the Lee Exchange.

ASHFIELD, MASS.—The Heath Telephone Company will extend its lines to Watson and Spruce Corner this summer.

CHIHUAHUA, MEXICO.—Otho Sartorius has secured a concession for the construction of a telephone line from Chihuahua to several towns of the state.

SAGOLA, MICH.—The Sagola Telephone Company has decided to build a line to Iron Mountain.

ORTONVILLE, MINN.—The Farmers' Co-Operative Telephone Company, of Parnell, will extend its lines into Graceville and Collis.

WATERVILLE, MINN.—The Cannon Valley Telephone Company will build a line from Waterville to Le Sueur Center.

WINONA, MINN.—The Money Creek Telephone Company is placing new poles, and extending its system.

WIMBLEDON, N. D.—A new telephone line from here to Spiritwood will be completed in a few days.

INTERLAKEN, N. Y.—It is quite certain that the Inter-Ocean Telephone Company will soon have a line in operation at Interlaken. It will connect with the line at Lodi and thence to Watkins.

PULTNEY, N. Y.—The Overland Telephone Company is making extensive improvements. It will build a new toll line to Hammondsport.

INDIAN CASTLE, N. Y.—The Interstate Telephone Company is about to begin the construction of a rural line from Indian Castle to Fort Plain.

LANCASTER, O.—The Lancaster Telephone Company is to spend $75,000 for the improvement of its plants; $60,000 will be spent in Lancaster, and the balance in enlarging and bettering the country lines.

SHELBY, OHIO.—The Shelby Local Telephone Company, recently incorporated under the laws of the State of Ohio with a capital stock of $60,000, will spend $12,000 in reconstructing its line.

CLAYSVILLE, PA.—The Claysville Telephone Company is extending its system and making a number of improvements.

CLEARFIELD, PA.—The Cambria County Telephone and Telegraph Company, which is controlled by the Huntingdon and Clearfield Company, will soon establish an exchange in Ebensburg.

OIL CITY, PA.—The Petroleum Telephone Company, at a meeting held in Oil City recently, passed a resolution authorizing the expenditure of a considerable amount of money in new cables and extensions to the service of the company in Titusville.

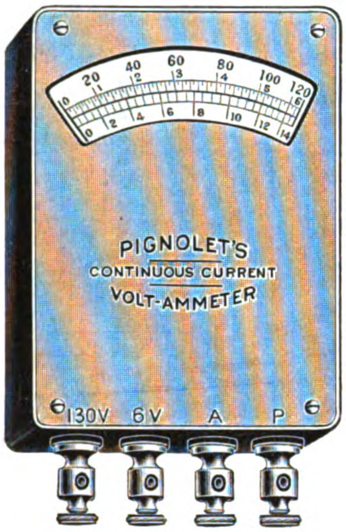
FORT WORTH, TEX.—The Fort Worth Telephone Company is to make extensive improvements, and is also to build a line between Sherman and Gainesville.

Book Notices

SLOANE'S ELECTRICIAN'S HANDY BOOK. By T. O'Conor Sloane. Published by The Norman W. Henley Publishing Company, New York. Price $3.50. 761 pages and 556 illustrations. Can be purchased through the book department of THE AMERICAN TELEPHONE JOURNAL.

As its title indicates, this volume is intended to be a kind of a desk companion for the electrician. It measures 6¼ x 4¾ and in general design attempts to follow the type of hand book first initiated by Trautwein. The volume is divided into fifty-one chapters, each one of which is a brief treatise upon some department of electrical engineering, such as electro-chemistry, primary batteries, magnets, the process of induction, direct current motors, alternating current generators, transformers, the care of dynamos and motors, arc lamps, electrical engineering measurements, etc. The volume differs from the other hand books for civil, mechanical and electrical engineers in that it is much more descriptive and far less statistical. The principles of each of the subjects treated are explained in a clear and lucid manner, aided by illustrations and diagrams, in so far as they may help to render the subject matter more comprehensible; but there are few tables and the volume is almost devoid of tabular information which most hand books contain. It is more of a descriptive textbook than a table book and as such will no doubt be warmly welcomed by many students of electricity.

Prevent Your Subscribers Kicking



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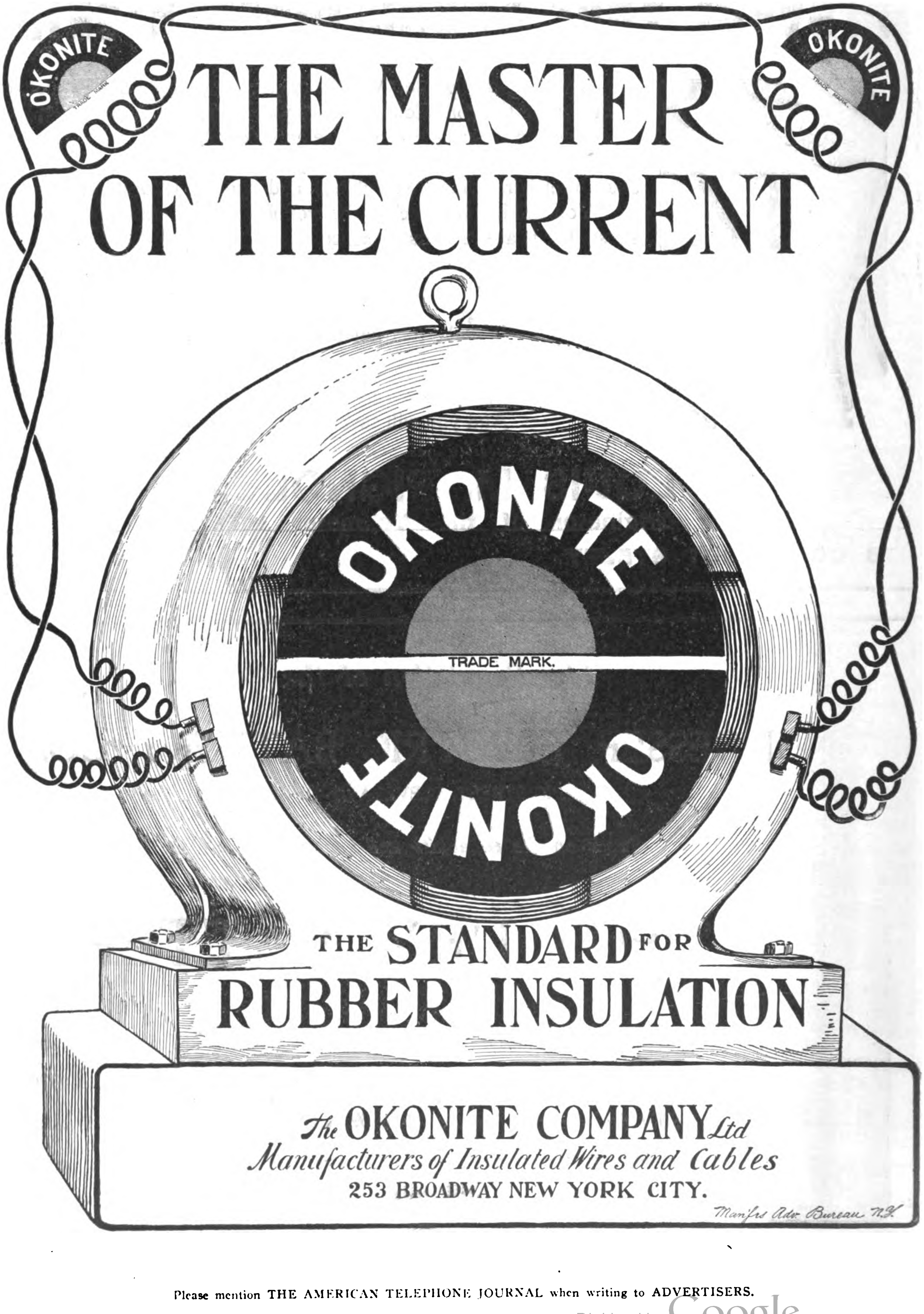

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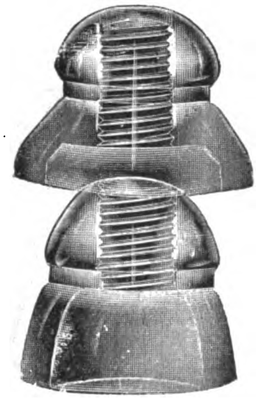

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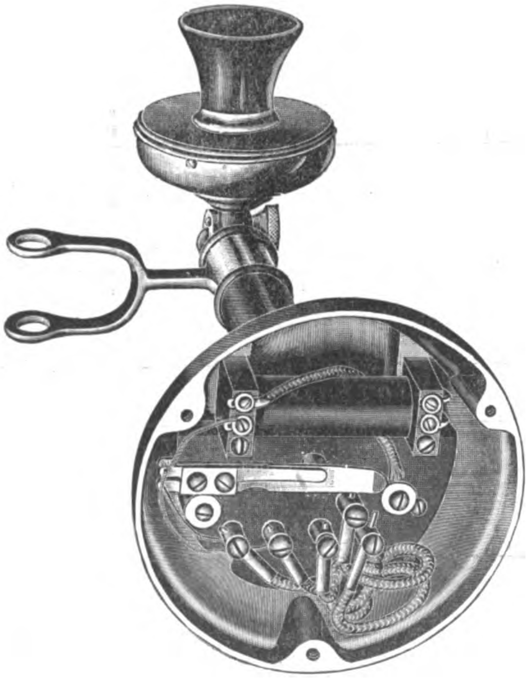

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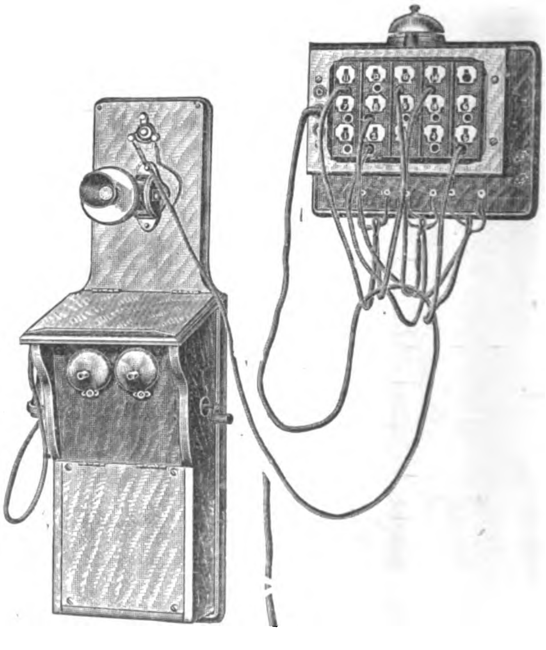

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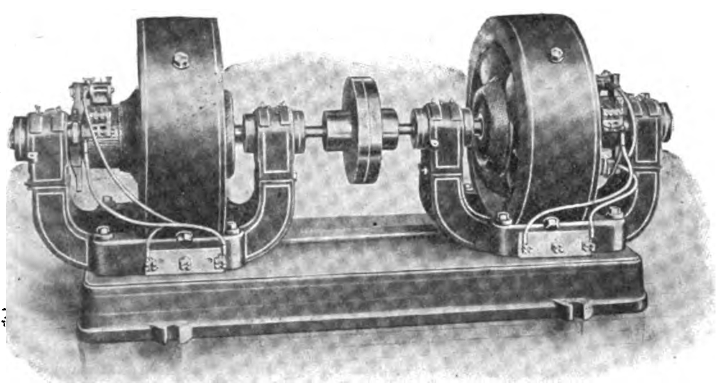

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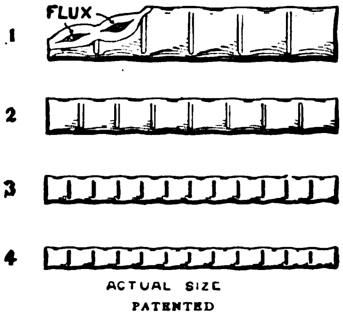

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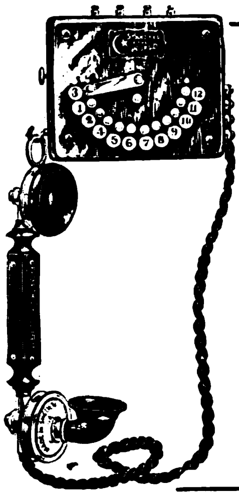

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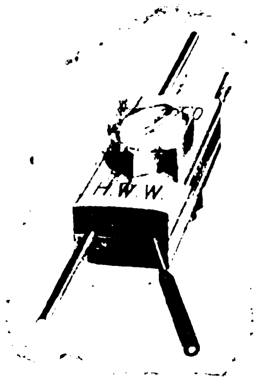

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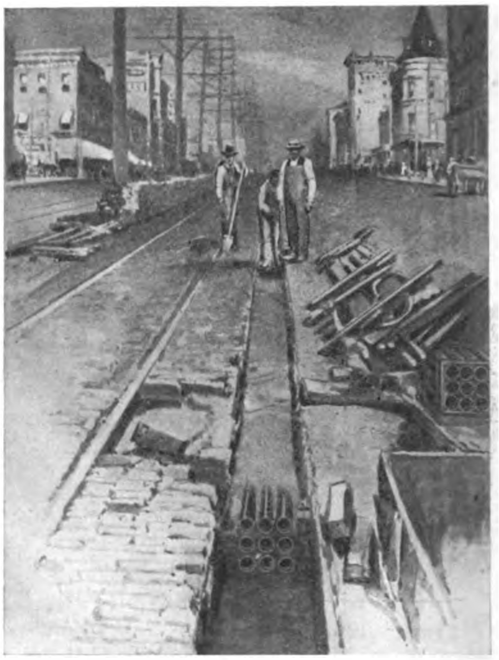

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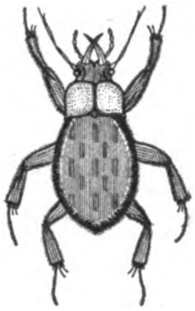

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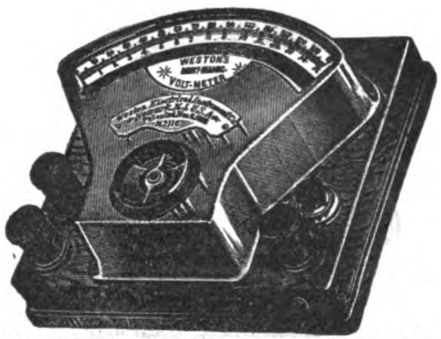

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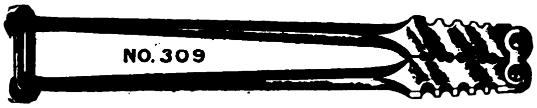

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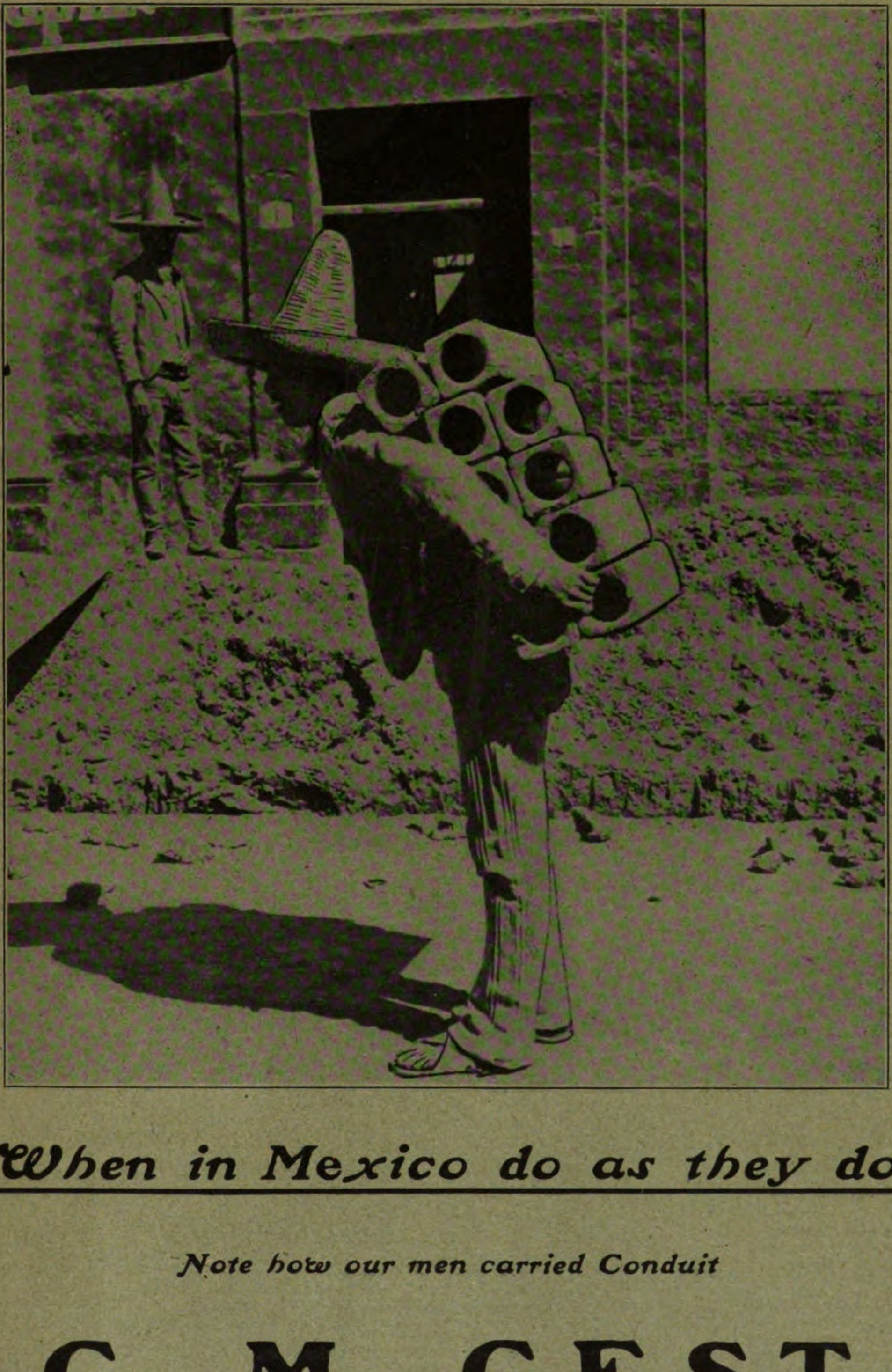

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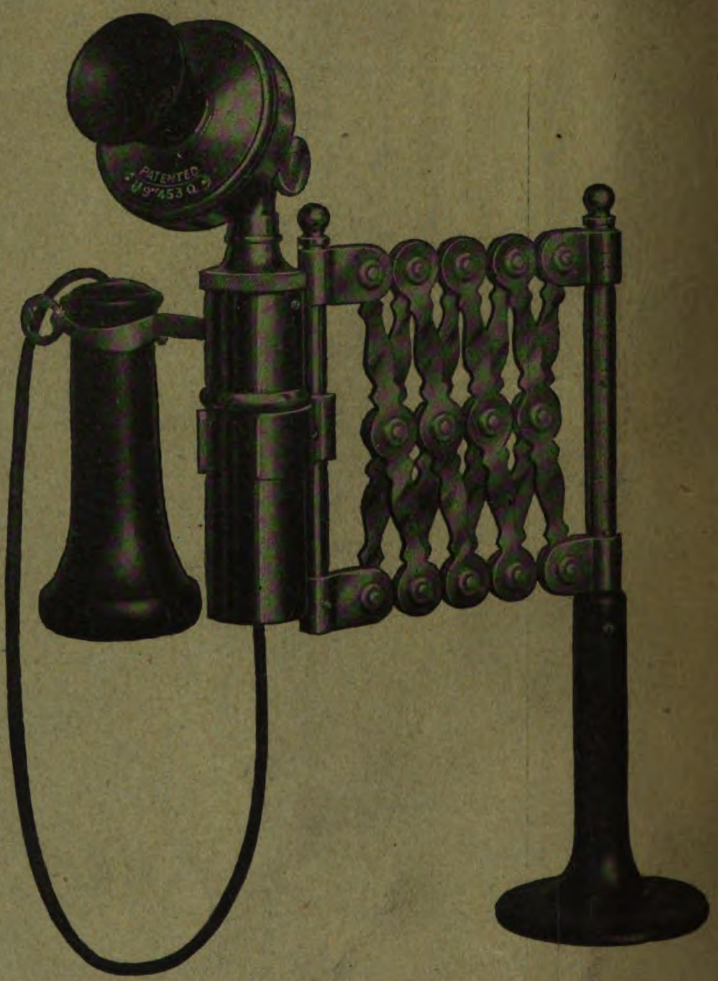

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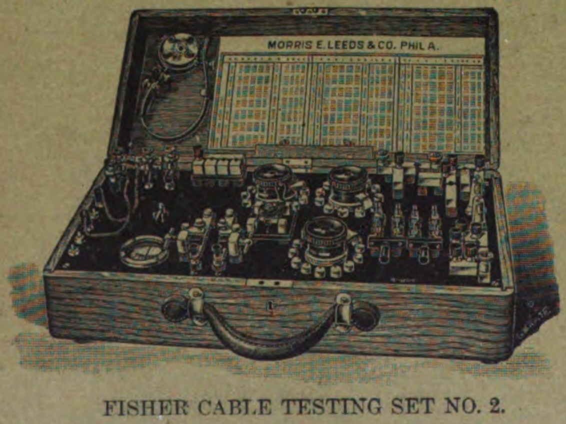
The "H.W.W." WIRE-CONNECTOR
IMPROVED TYPE
(Patented Feb. 11, 1902)

The Standard Test-Connector for Telephone Wires.

In "normal" position, it will connect .040" and .064", .040" and .080", .064" and .080", .064" and .104", and .080" and .104" wires. In "reversed" position, any two similar wires, .051" to .104" diameters.

Benedict & Burnham
Brass & Copper Company
211-213 Lake St., Chicago



FISHER CABLE TESTING SET NO. 2.

THE LEEDS & NORTHRUP CO.
259 N. BROAD ST., PHILADELPHIA
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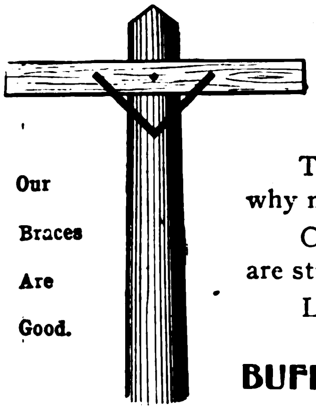
Electrical Measuring Instruments

Cable Testing Apparatus, Portable Testing Sets, Potentiometers, Improved Types of D'Arsonval Galvanometers, Resistance Standards, Resistance Boxes, Standard Condensers, Conductivity Testing Apparatus, etc.



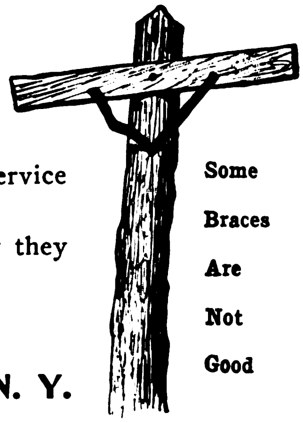
PLAIN AND GALVANIZED CROSS ARM BRACES

To protect yourself against damage suits and interference with service why not order our **Cross Arm Braces** and be sure they are right.

Our Braces are made from stiff **Bessemer Steel.** Consequently they are stronger than any other.

Let us quote you.

BUFFALO STEEL COMPANY, Tonawanda, N. Y.



SPECIFY

The "Chloride Accumulator"

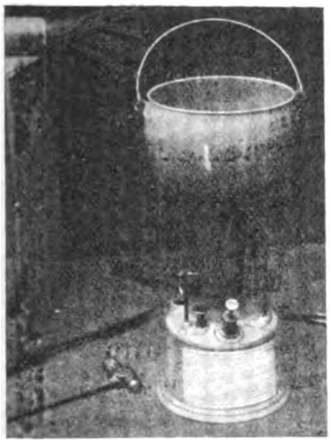
IT IS STANDARD WITH THE OPERATING COMPANIES AND THE LARGEST MANUFACTURING COMPANIES

THE ELECTRIC STORAGE BATTERY CO.

Philadelphia, Pa.

SALES OFFICES:

Philadelphia, Allegheny Ave. & 19th St.
New York, 100 Broadway.
Boston, 60 State St.
Chicago, Marquette Bldg.
St. Louis, Wainwright Bldg.
Cleveland, Citizens' Bldg.
San Francisco, Rialto Bldg.
Canada, Canadian General Electric Co., Ltd., Toronto.



You know that when it is necessary to use a furnace indoors it is not desirable to keep it burning any longer than is necessary.

The Archambault Kerosene Furnace

develops a greater heat than any other, and consequently does not have to remain lit so long.

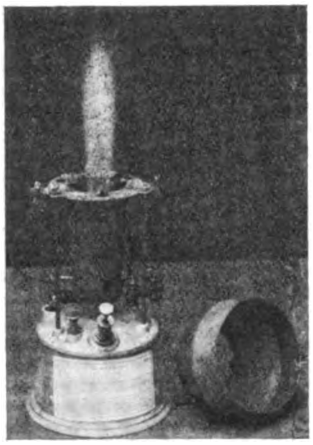
Besides, its use does not violate

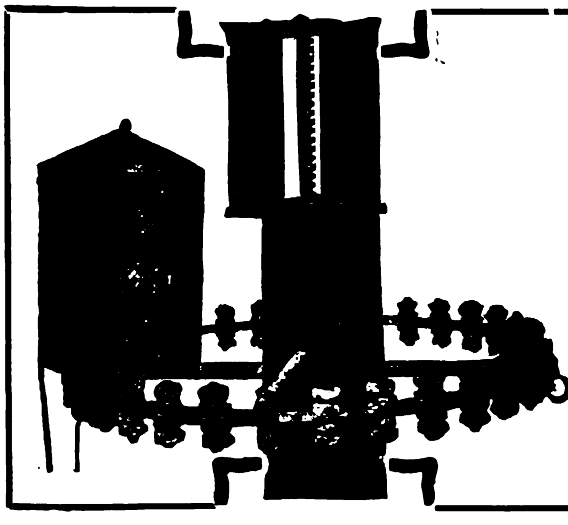
Any of the Insurance Laws

Consider these facts when you place your next order and let us give you prices and further particulars.

THE ARCHAMBAULT CO.

204 Lenox Avenue, New York City



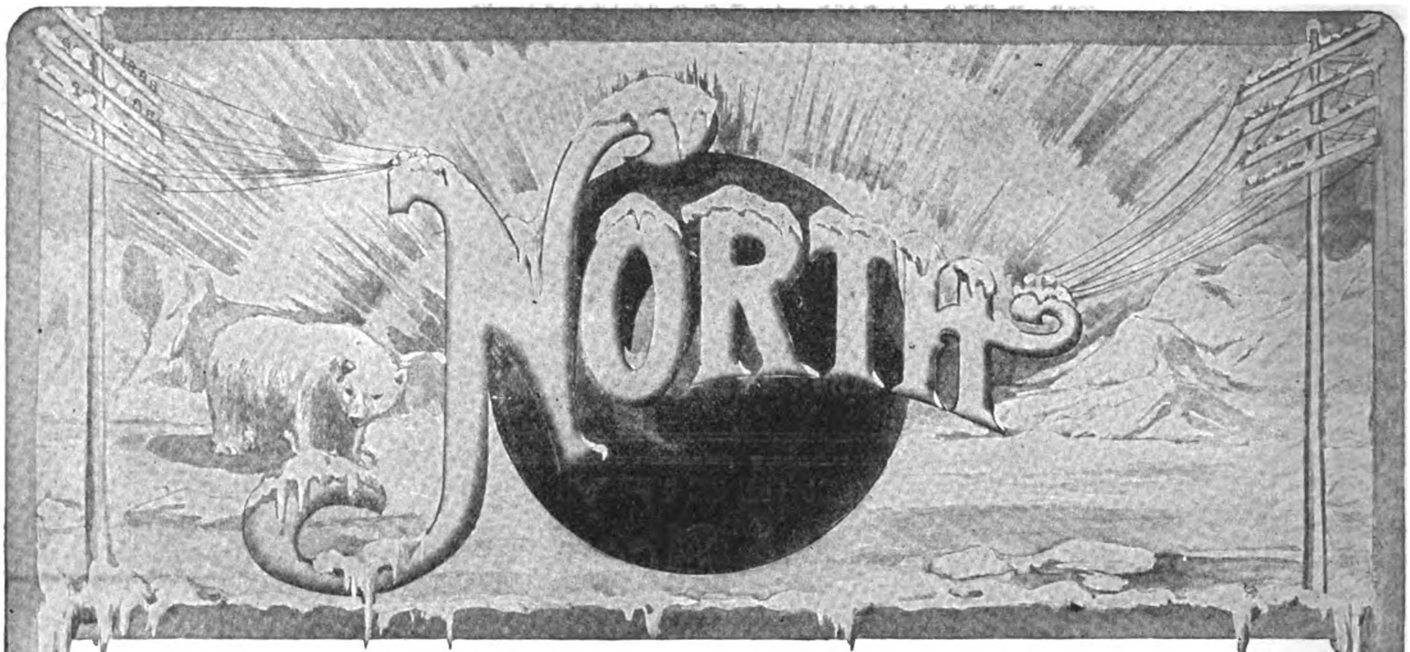


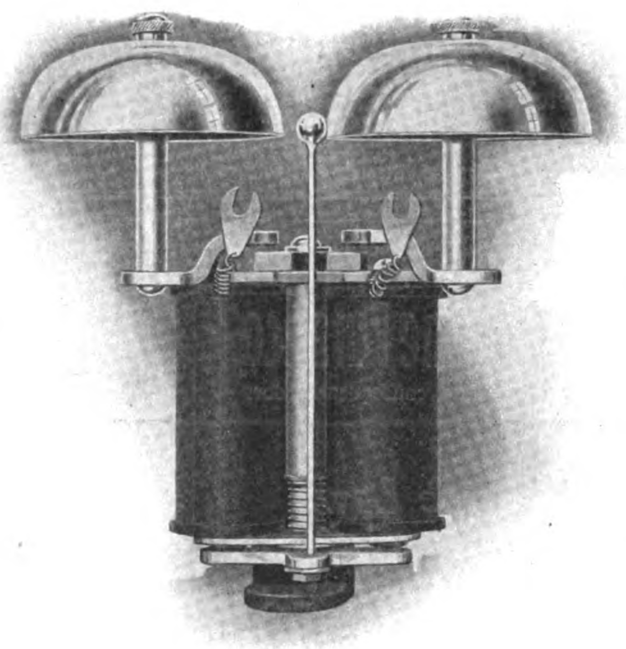
THE HALL TYPE D. CABLE TERMINAL

WITH DISTRIBUTING RING

Designed especially for ***Underground Installations.*** Each pair provided with ***Absolute Lightning Protection,*** and mounted on ***Hard Rubber Only.***
Write for Catalogue.

Mountain State Electrical Company,
Sole Manufacturers,
WHEELING, W. VA.





"NORTH'S" NEW RINGER is a radical departure from the usual.

Weighing scale **knife** edge bearing armature—no friction, can't tighten or drop out of place. Adjusted by one small screw.

It's mounted on the cabinet by two extension lugs in close proximity—can't be affected by wood shrinkage.

Entirely self-contained—the gong stand is on the ringer base.

Tested to all services and known to be of the usual "NORTH" quality.

Main Office and Factory:
ST. CLAIR STREET, CLEVELAND, OHIO.

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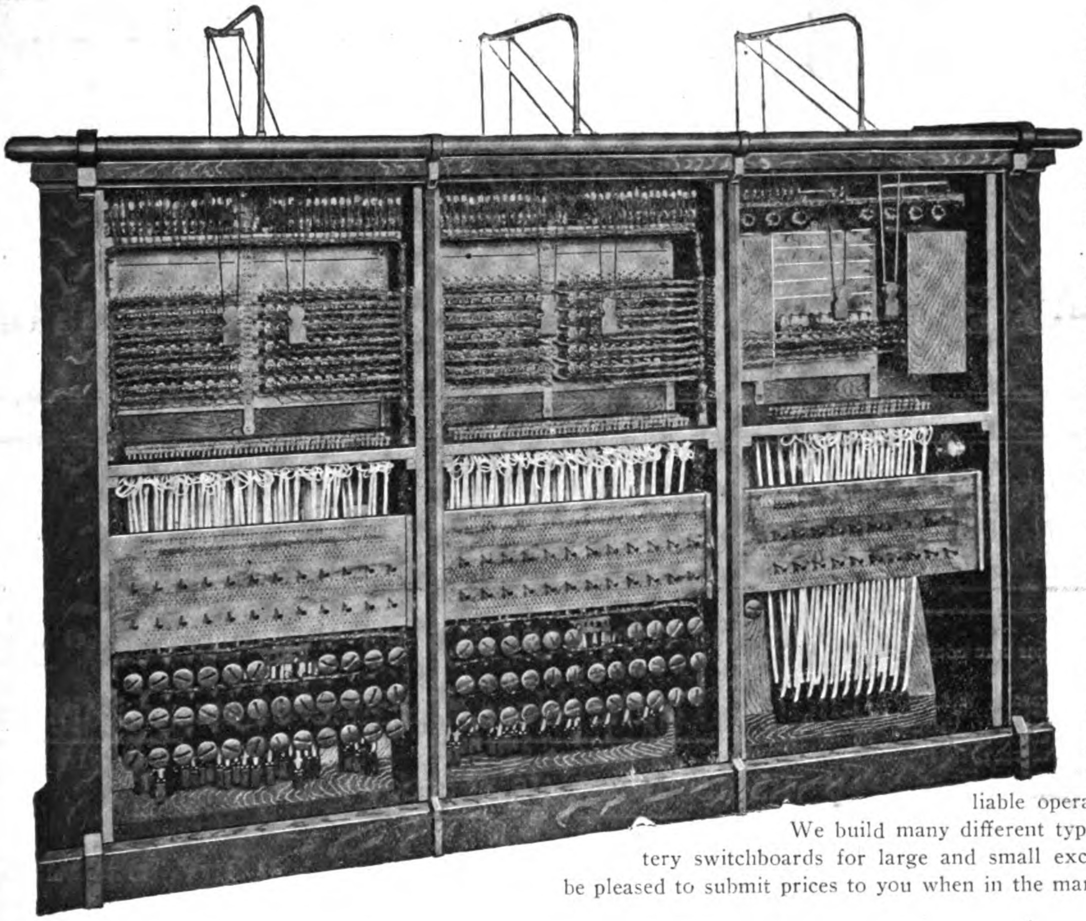
Western Office: MONADNOCK BLDG., CHICAGO, ILL.

THE
NORTH ELECTRIC CO.
··CLEVELAND, OHIO··

MANZ
CLEV'D.

CENTURY
100 % GOOD

Common Battery Switchboards



The above cut illustrates the back of one of our three position common battery switchboards, and shows the arrangement of the different parts.

Every piece of apparatus is so fastened that it can be easily inspected, and, if necessary, removed without interfering with any other parts.

In the back of each position is provided a distributing board on which all lines in that position terminate.

All the apparatus is exceedingly simple in construction, assuring reliable operation at all times.

We build many different types of common battery switchboards for large and small exchanges, and would be pleased to submit prices to you when in the market.

CENTURY TELEPHONE CONSTRUCTION CO.
536 ELLICOTT SQUARE
BUFFALO, N.Y.

DRY BATTERY

Sold under a guarantee.

E. M. F. 1.52; 14 to 18 amperes.

Cost no more than inferior cells.

Fahnestock Clip.

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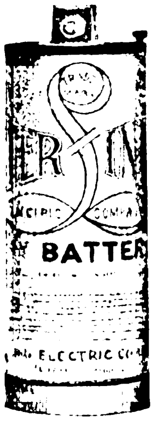

Will not run down on the shelf.

Will last longer than other good cells.

Will save you money.

Binding Post.

Do They Satisfy You?

STERLING ELECTRIC COMPANY, La Fayette Indiana

The Automatic

Among the cities in which it has been adopted are:

Chicago, Ill.
Grand Rapids, Mich.
Columbus, O.
Dayton, O.
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Portland, Me.
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Fall River, Mass.
New Bedford, Mass.
Los Angeles, Cal.
San Diego, Cal.
Hopkinsville, Ky.
Sioux City, Ia.
Cleburne, Tex.
Columbus, Ga.
South Bend, Ind.
Augusta, Ga.
Medford, Wis.
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Princeton, N. J.
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Battle Creek, Mich.
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Pentwater, Mich.
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Wilmington, Del.
Riverside, Cal.
Traverse City, Mich.
Hastings, Neb.
Wausau, Wis.
El Paso, Tex.
Berlin, Germany.

is the telephone system that appeals to all;

To the User, because of its promptness, its accuracy, its secrecy;

To the Operating Company, because of its economy of operation and maintenance;

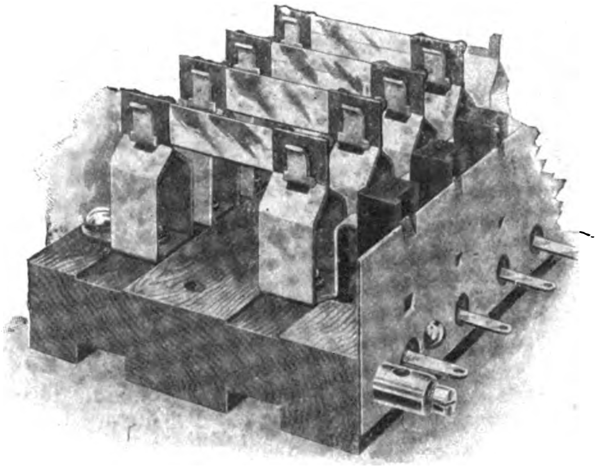
To the investor, because it places the securities of a telephone company on a firm basis, and keeps them stable and profitable.

Automatic Electric Company

Van Buren and Morgan Streets CHICAGO, U. S. A.

DEAN TELEPHONE APPARATUS

Express Switchboard Arresters



Last week we told you about our new drop and jack for express type switchboards.

The above illustration shows our new arrester to be used in connection with these switchboards.

Like all other Dean apparatus, it is built to eliminate troubles—a most common occurrence in small switchboard arresters.

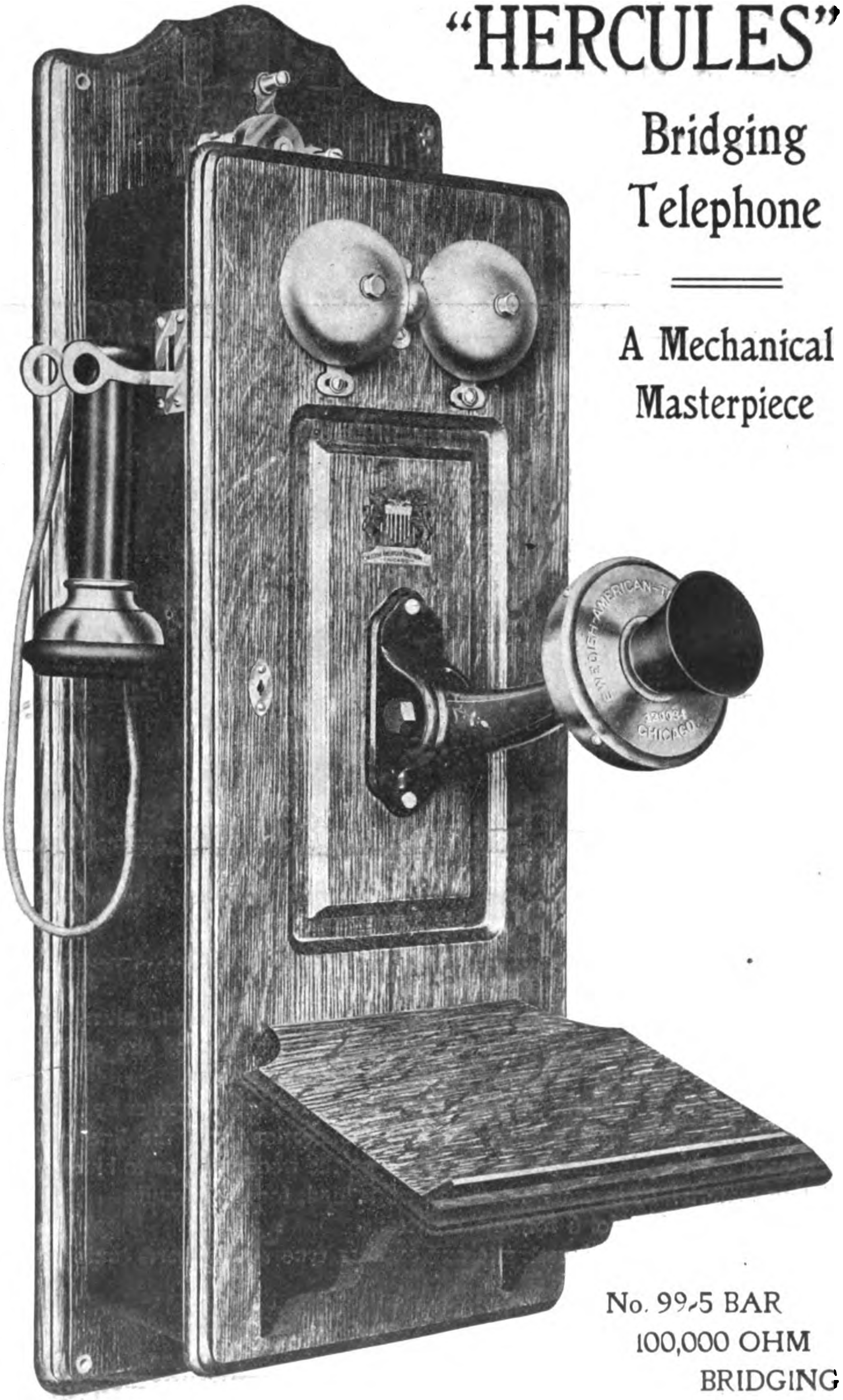
The fuses are tightly gripped in special clamps which will always hold their pressure. This is made possible by the peculiar construction of the springs, which will not allow the clamp to be spread enough to spoil the tension.

The metal parts of this arrester are securely fastened together by means of hollow rivets, thus assuring a positive electrical connection from the line cable to the switchboard cable. No dependence is placed on the woodwork, or to binding through insulating material, as in other arresters of this kind, for this circuit.

See our folder No. 6 for further details.

It will pay you to investigate our express type switchboard equipment before placing your next order.

THE DEAN ELECTRIC COMPANY
ELYRIA · OHIO



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Bridging
Telephone

A Mechanical
Masterpiece

No. 99-5 BAR
100,000 OHM
BRIDGING

Swedish-American Tel. Co. CHICAGO
U. S. A.

MAKING MONEY EVERY DAY

BAIRD PAY-STATIONS

This type made with from 1 to 5 slots.

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Investigate our liberal TRIAL OFFER on Lock-Out Telephones.

Daily Income for Users.

Telephoning a Strictly Cash Transaction.

They Create Dividends.

They Cultivate the Telephone Habit.

A TRIAL ORDER WILL DEMONSTRATE THAT YOU NEED THEM.

Send for Some NOW.

BAIRD MANUFACTURING CO.

Manufacturers of Baird Secret Service Telephone System,

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Ready Pole Seats

W. G. NAGEL
TOLEDO OHIO. U. S. A.

Strongest Pole Seat Made.

All Iron, adjustable to any Pole.

Ready Reels, Tools, &c. Cable and Telephone Supplies

The W. G. Nagel Electric Co.

Toledo, Ohio.

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Fill out this coupon, paste it on a postal and send to Morgan & Wright. Samples of tape that *users* say is *the best tape made* will be sent forthwith.

MORGAN & WRIGHT, CHICAGO:

Please send samples of your FRICTION TAPE.

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Kellogg
Intercommunicating
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Are Perfect in Every Detail

No slightest part is experimental. Everything tried and thoroughly proved before leaving us.

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Congress and Green Streets, Chicago

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KELLOGG PHILOSOPHY.

THE
FOURTH DIMENSION
OF SPACE
HAS LONG BEEN A DEBATABLE
AND UNSOLVED PROBLEM, BUT
THE
FOUR-PARTY
HARMONIC
SYSTEM
HAS COMPLETELY
SOLVED
THE PARTY-LINE PROBLEM.

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KELLOGG SWITCHBOARD & SUPPLY CO.
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SOLE MANUFACTURERS

THE BULL TONGUE

IS AN ANCHOR THAT HOLDS

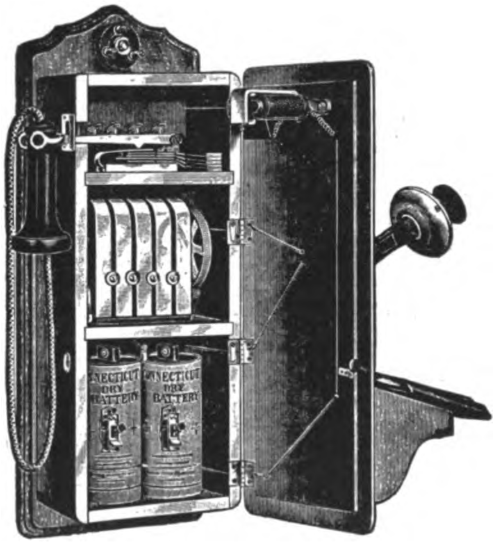
35 Cents Worth Does the Job

Get Wise

Our Circular is Yours. Ask!

BULL TONGUE LAND ANCHOR

141 SOUTH CLINTON ST., CHICAGO



MOST DURABLE BRIDGER MADE

With our non-interfering 'phone you can ring through 50 'phones with receiver off the hook.
Conn. 4-Party Selective System is most simple and efficient made.
Ask us about our automatic 'phone for exchange connection. In use everywhere.

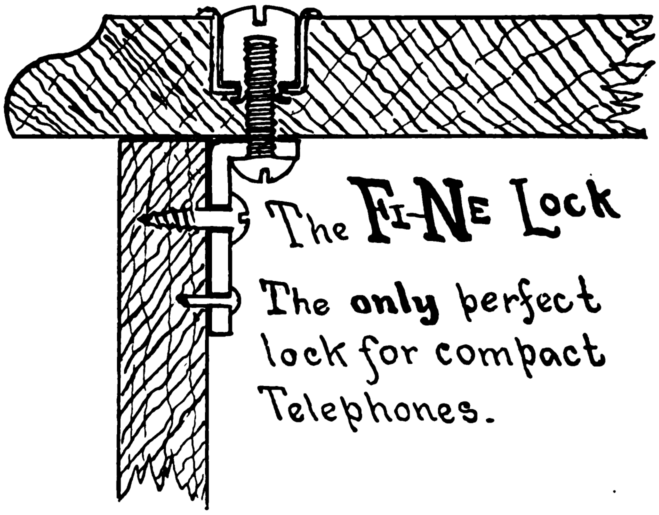
Conn. Telephone & Electric Co.

MERIDEN, CONN., U. S. A.

Send for Large Catalog

The Biggest Little Thing

we ever got up is



Specify the FI-NE LOCK
even tho' you order "other fellows" Phones

Other BIG THINGS are our FI-NE GENERATOR
FI-NE TUBULAR DROP

In fact ALL OUR STUFF IS FI-NE

FISK-NEWHALL TELEPHONE MFG. CO.
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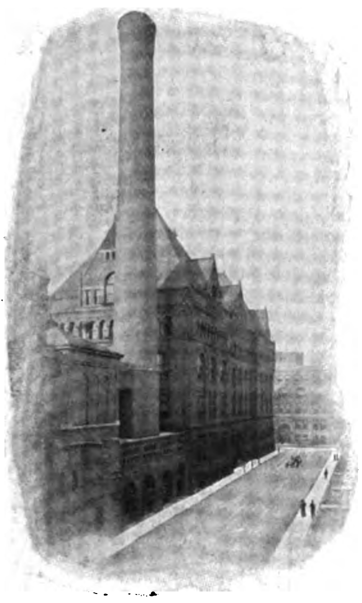

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Opportunity knocks at the door of all Young Men.
Young Men of Ambition are at the door
before the knocking ceases.

The men who have risen to the highest places are those who have seized the first favorable occasions to learn more about their work and be **masters** of it. They **fitted** themselves for better work.

This is **your** chance to prepare yourself for future opportunities.

If you do not accept **this** opportunity to educate yourself in your spare moments the chances are you will not be **able** to grasp an opportunity to become a Telephone Manager, Superintendent, or Consulting or Constructing Engineer, because you are not fitted to **hold** the position. Without education few men have any reasonable chance of success.

Perhaps you can't afford to give up your position to go to an engineering college to get a technical education. If so, **The American School of Correspondence** can give you a technical training that will fit you for advancement and a responsible position in the Telephone industry without interfering with your regular work. It will make **your** services valuable and always in demand.

There are **no** entrance examinations. Every man who can **read** and **write** is eligible to take a course.

The course in Telephone work is prepared by some of the **ablest engineers** and **teachers** in the country, and the instruction is under the direction of **members** of the **faculty** of one of the **foremost engineering schools**--Armour Institute of Technology.

Fill out the attached coupon and send it to us **to-day** and we will send **free** our 200-page Bulletin, giving full outlines of our courses in **Telephony,** Electrical, Mechanical, Steam and Civil Engineering, Architecture, Mechanical Drawing, Textiles and College Preparatory (preparing for entrance to engineering colleges).

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Please send me, free of charge, 200 page Bulletin and full information regarding your course in Telephony as advertised in AMERICAN TELEPHONE JOURNAL 6-24-'05.

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Amer. Tel. Jour. 6-24-'05.

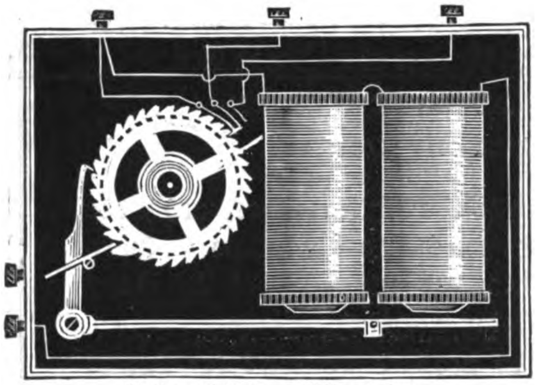
Please mention THE AMERICAN TELEPHONE JOURNAL when writing to ADVERTISERS.

Watkins Selector and Lock Out

Most simple and perfect working selector and lock out ever invented.

Nothing to get out of order.

For grounded circuit or metallic circuit lines, can be operated with batteries or direct current generator. Send for circular giving diagram of circuit.



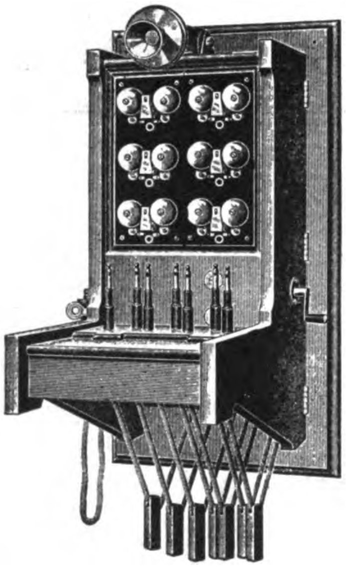
Watkins Selector and Lock Out

No bells ring only the one you want. When line is in use a signal is shown at every telephone on the line. Can be attached to your old telephone in five minutes. Anyone can do it. For each telephone on the line the peg on selector wheel has different position.

Farmer Line Switchboards

Express Switchboards for Exchanges

Try our Six Bar Generator Telephones. Never fail to ring under all circumstances. Sent on thirty days' trial. Ask for our catalogue.



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HALLER MACHINE CO.,

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Designers and Manufacturers of Electrical and Mechanical Specialties.

A—SIGN WORKS:

Electric

All Metal

Transparent.

Glass Signs.

Above cut shows Standard Telephone Hotel Switchboard Glass Signs With Jeweled Letters.

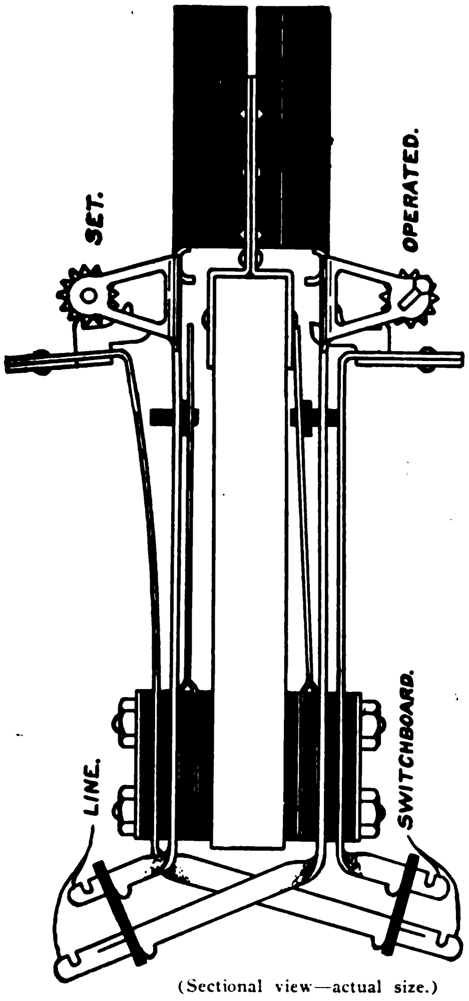
WE MAKE MANY KINDS OF SIGNS. SEND FOR OUR BULLETINS.

B—MACHINE SHOP:

Sheet Metal Specialties, Punch Press Work, Electrical and Machinery Specialties, Die Work, Gear Cutting, Etc.,

TO ORDER

COOK'S No. 8



(Sectional view—actual size.)

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AND THE

ONLY PATENTS

ON

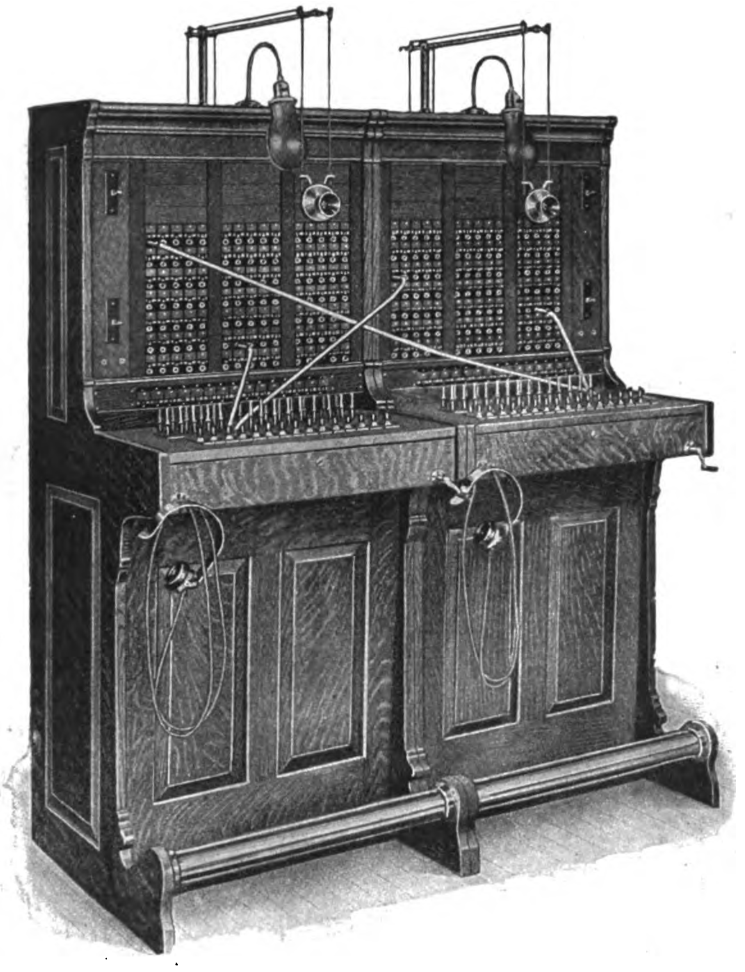
SELF SOLDERING PROTECTORS

Frank B. Cook

Manufacturer

238 W. Lake St., - CHICAGO, Ill.

MONARCH
APPARATUS



The Monarch reputation long since established on telephones is being upheld with the switchboard. The same characteristics of simplicity, durability and efficiency are noticeable in all of the equipment. Accessibility of all parts is a feature ever prominent in Monarch Apparatus. The removable shelf idea of the telephone is carried out in a switchboard drop with a coil which can be removed without breaking any soldered connections. A complete description of this and many other features is given in the new catalogue, a copy of which will be mailed upon request.

During the National Convention to be held June 20, 21, 22, we will be pleased to see you at our rooms, 642 and 644 Auditorium Hotel, Chicago.

MONARCH TELEPHONE MFG. CO.

10-16 SO. CLINTON ST. CHICAGO, ILLS.

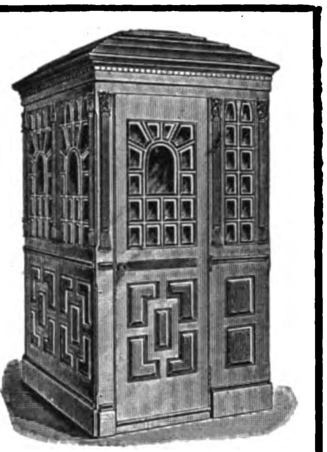
The Nose on Your Face

is not more prominent than the fact, that if your Public Pay Stations are not equipped with

Seaman's Sound Proof Booths

you are losing hundreds of dollars yearly; because people who have occasion to use pay stations would rather write a letter or call upon a person than risk the possibility of their conversation being overheard. Real Secret Service from pay stations can only be secured by the use of sound proof booths. Ours are the kind you want. Write for catalogue.

W. S. SEAMAN & CO.
216 EAST WATER ST. MILWAUKEE, WIS.



OUR NO. 38

The Peer Of All Automatics

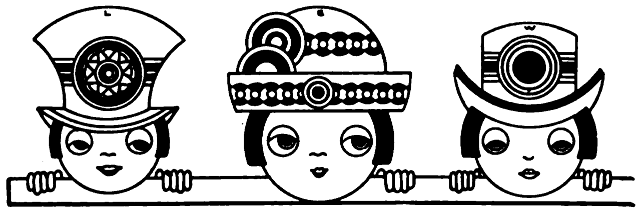
Easy to Connect Up

Inter Communicating Non Interfering

Central Battery

Can be arranged for Branch Exchange Systems with Connection to trunk lines.

S. H. COUCH CO.
162 Pearl St. :: :: :: Boston, Mass.



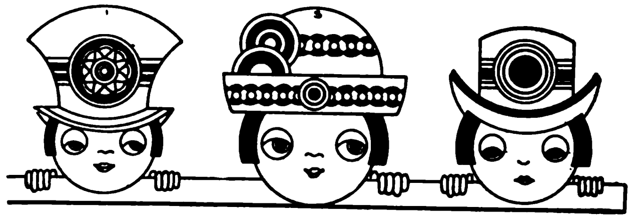
How to Make Two Blades of Grass Appear Where Only One Grew Before

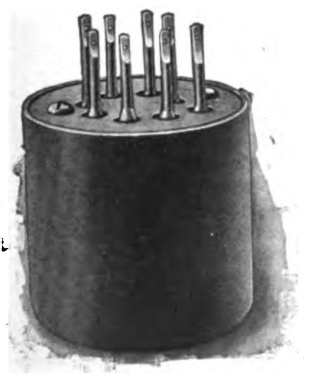
requires a certain amount of knowledge which costs time and money to acquire.

We will freely show you how to make duplicate copies of your toll and trouble tickets without the use of a separate carbon sheet if you will let us have your name and address.

Doesn't this proposition appeal to you?

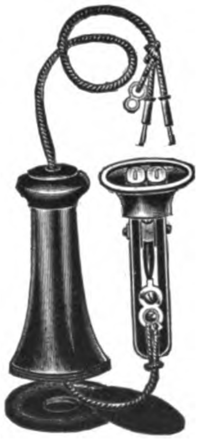
General Manifold Company
FRANKLIN, PA.





The mail is quick, the telegraph is quicker, but the "Eastern" ships on the day the order is received and you don't have to wait six weeks for your telephones.

Eastern Tel. Mfg. Co.
West Chester, Pa.



THE

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is acknowledged by leading engineers to be mechanically and electrically superior.

It will pay exchanges and assemblers to use our receiver.

Write for prices and experts' opinion to-day

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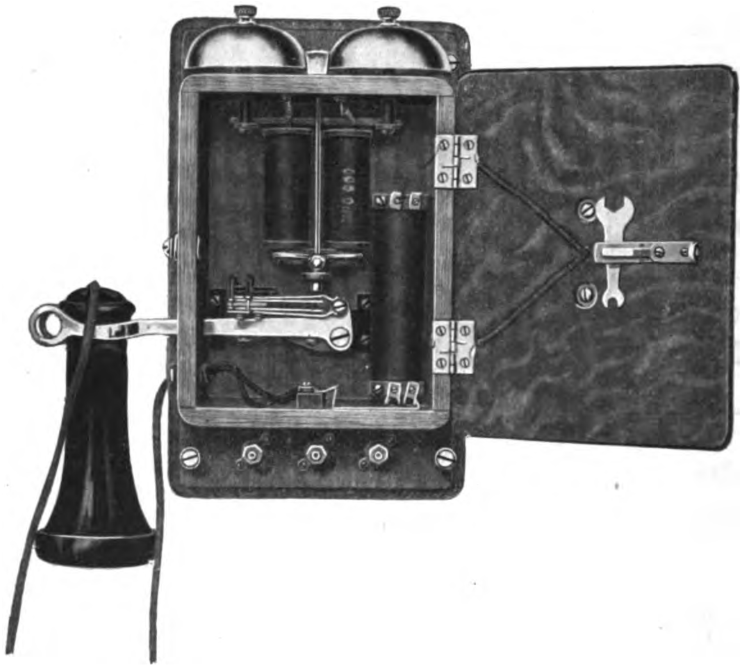
STROMBERG-CARLSON

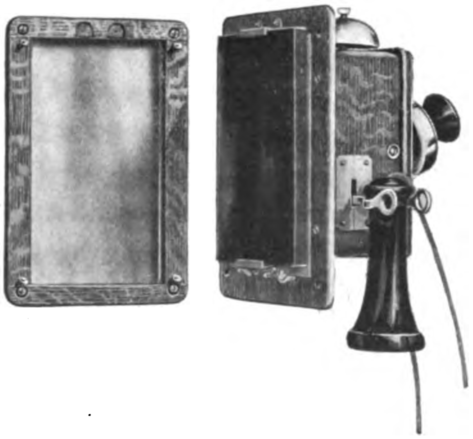
TAKE THIS TELEPHONE AS AN EXAMPLE

The most prominent feature of all STROMBERG-CARLSON APPARATUS is QUALITY. Quality of Design, Quality of Material, Quality of Workmanship.

There is a distinct difference between this telephone as here shown and the "Just as good kind."

We designate this as our No. 532 Telephone. The illustrations give one a good idea of the construction of the cabinet and the way the parts are assembled.





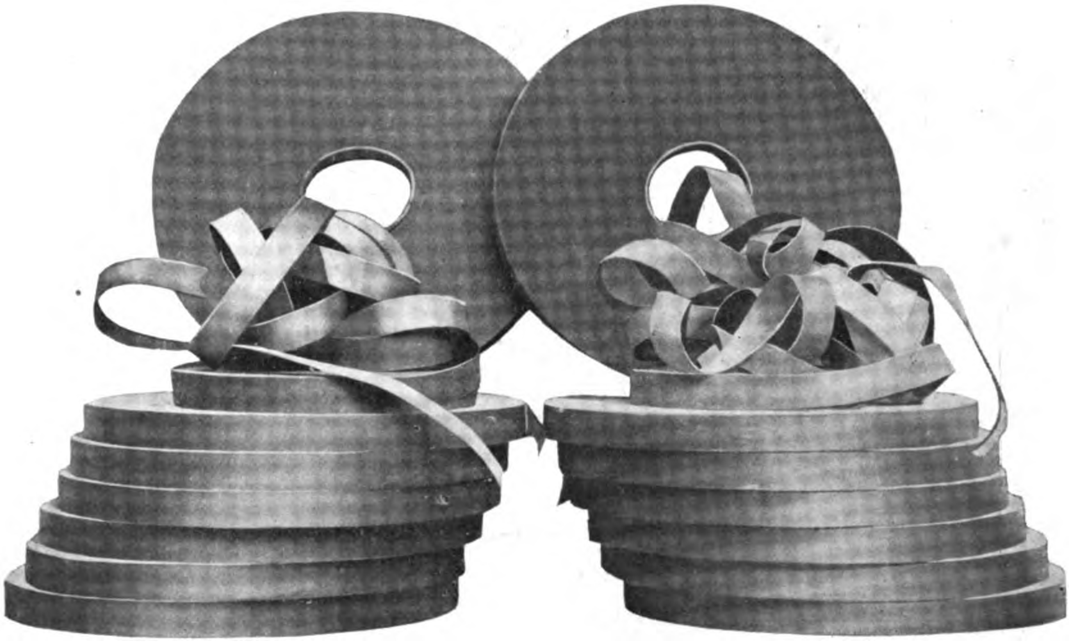
The illustration showing the cabinet taken apart explains how one may get at the condenser if necessary to change it or examine the connections. The telephone is, of course, equipped with our standard transmitter, receiver, self-contained ringer, hookswitch, and an adjustable transmitter arm.

We will soon issue a new Bulletin on Central Energy Telephones.

A postal will bring you a copy.

TELEPHONE M'F'G. CO.
ROCHESTER, N.Y. CHICAGO, ILL.

STROMBERG-CARLSON CABLE



THE "PAPER THAT PAYS"

The insulating paper used in the manufacture of Stromberg-Carlson Cable is pure Manilla Hemp manufactured especially for this purpose. Before it is accepted we subject it to several rigid laboratory tests.

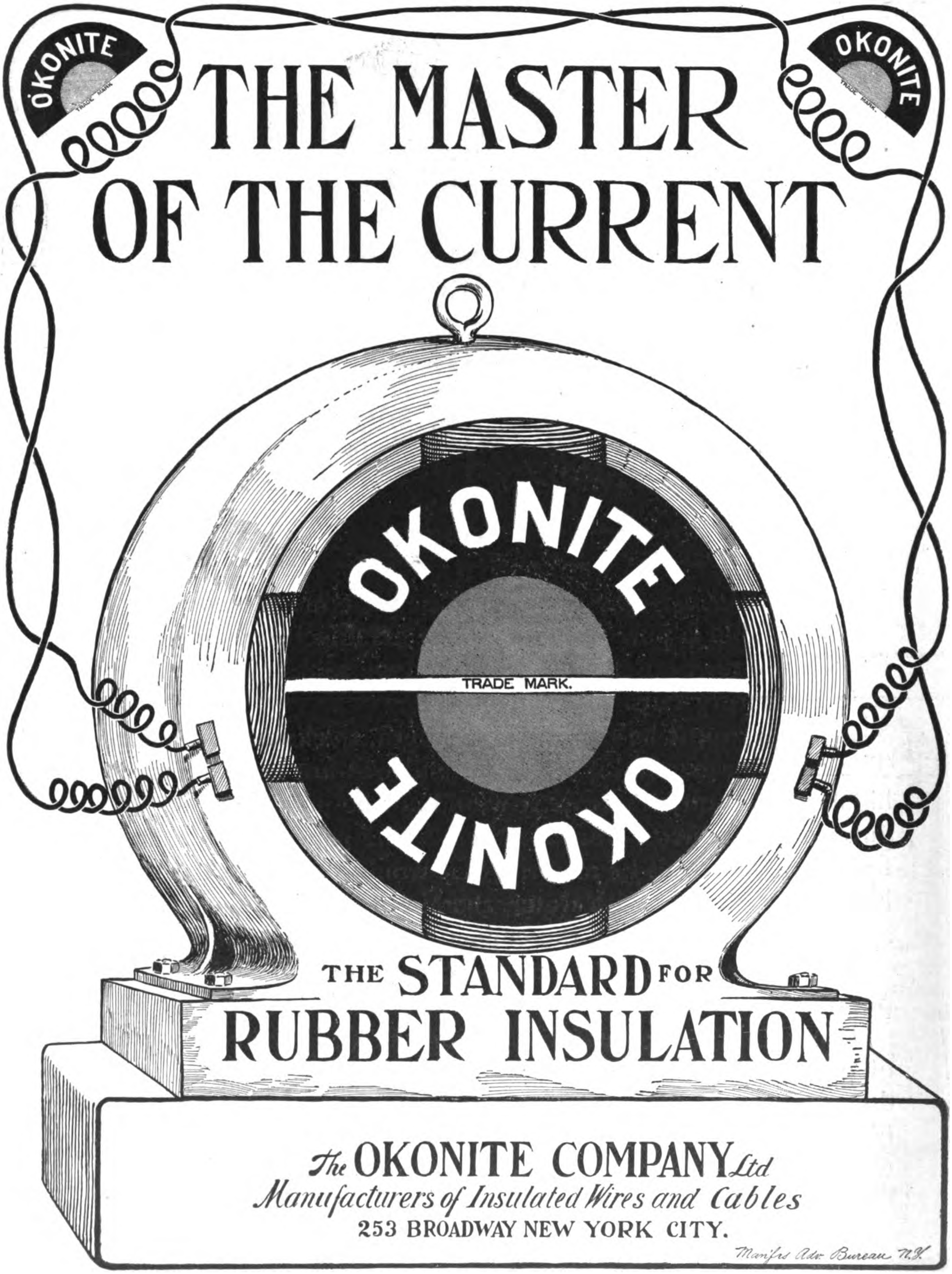
All paper must be of uniform strength, thickness and color. The coloring material is a fast dye and will not fade. This is highly important, otherwise it would not be possible to distinguish one conductor from another. The paper must be free from any chemicals or material that would cause a reaction if brought in contact with water, thereby producing a chemical agent that would attack the copper wire and insulation.

The paper is wound around each conductor in two layers put on in reverse directions. This must be done with great care.

Paper Splices are made by lapping the end of the new coil of paper under the end of the last coil tying the two ends down tightly to the wire with a serving of silk which extends from 1½ to 2 inches on each side of the joint. Splices so made will not allow the ends to slip apart and expose the wire.

NOTE—Next week we tell about the cable sheath.

STROMBERG-CARLSON TELEPHONE MFG. CO.
ROCHESTER, N.Y. CHICAGO, ILL.



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THE MOST PERFECT, CHEAP AND EFFICIENT TERMINAL ON THE MARKET. .. ..

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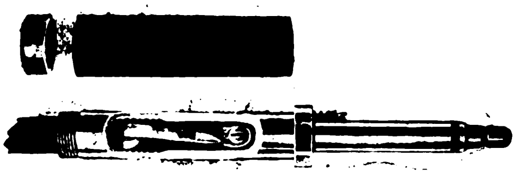

SPECIFICATIONS

The V-B PLUG is made up of solid bar stock. Tip portions are formed of two parts, one consisting of Bessemer steel, and the other of brass. Fibre sleeve is free to rotate on plug. This feature does away with the possibility of operator twisting cord while plug is in jack, and also gives easy access to the cord connections.

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TELEPHONES AND SWITCHBOARDS

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We can save you at least 10% on

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no matter where you are buying now.

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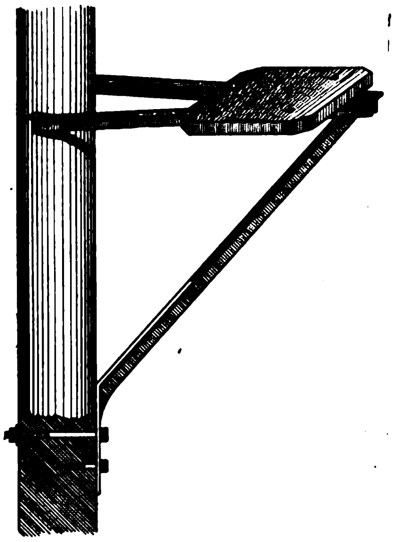
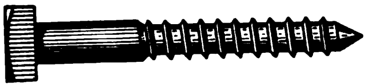
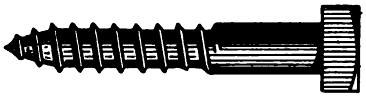


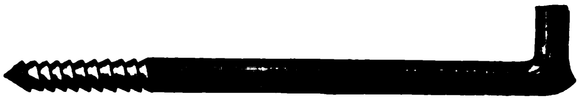
Pole Seat



Cone Point Lag Screw

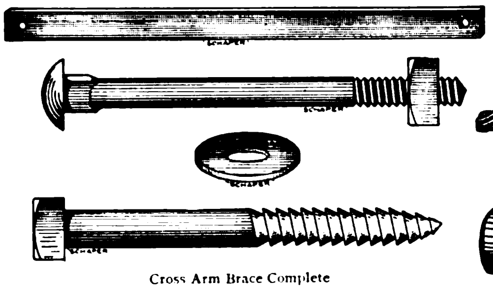


Gimlet Point Lag Screw

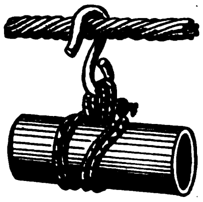


Fetter Drive Pole Step

Fetter Drive Screw

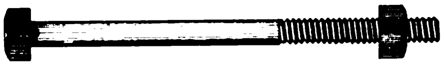


Cross Arm Brace Complete



Marlin Cable Hanger

Square Washer



Through Bolt

Guy Rod

Wire Rope Thimble

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SCHAPER CONSTRUCTION MATERIAL CO.,

Electrical Exchange Building, New York City.

The Rural Subscribers, Central Operator and Manager have reason for looking on the DARK SIDE of things. Considering the NEGLECT of their SPECIAL NEEDS it is one of the WONDERS of the WORLD that so much business has been done with such ***unsuitable*** appliances.

It was a case of "DO WITHOUT" Telephone Service, or use the FREAK ways of GETTING ALONG with apparatus that was ONLY designed for City Uses.

Our Central Relay fits the Rural line Conditions like

"The Paper on the Wall."

It was designed and perfected

FOR THE PURPOSE

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If you want solder that will flow quickly and surely to place and leave smooth work without losing time in preparing or applying flux acid, get

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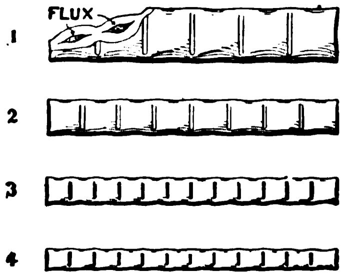

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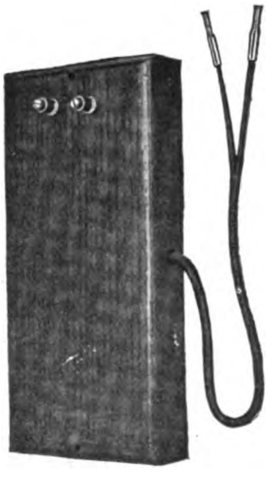
J. W. Milton writes: Easiest thing in the world to sell Andrae Telephones in this territory because in making a test of the 45 Giant Bridging 'Phones, three extension bells and bell on switchboard we rang the last bell as distinctly as the first one on twenty miles of line.



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Made in Several Styles. Write for Circulars.

The accompanying cut illustrates our new form of Condenser, fitted in a handsome quarter-sawed oak case, which is especially adapted for use in connection with telephones ALREADY IN OPERATION.

Its construction obviates the necessity of an expert's services for its *successful installation.*

We will furnish any telephone company with as many Condensers as are necessary to equip an entire line. If not exactly as represented they may be returned to us.

WRITE FOR OUR FREE BOOK No. 11

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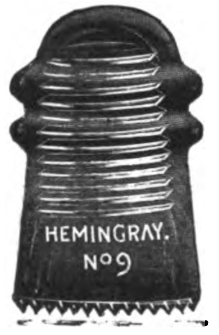
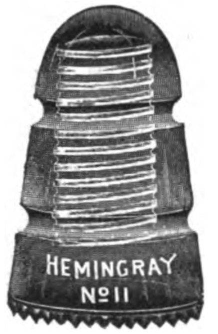
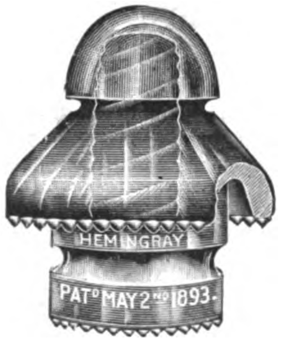
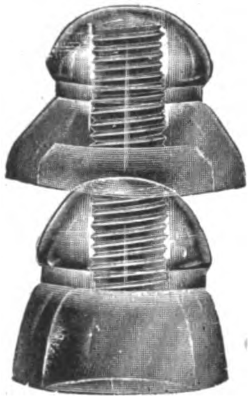




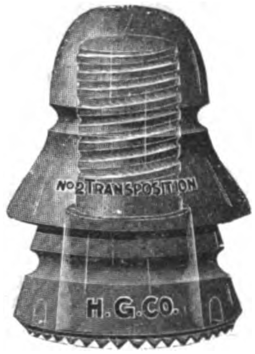
The
Perfect



Transposition
Insulator.



Two-Piece
Transposition.



The Hemingray Glass Co.

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Our long acquaintance with practical construction men has made it possible for us to perfect the designs of the articles we manufacture. Our methods of forging, punching, galvanizing, etc., have each been selected in reference to meeting high grade specification requirements.

We guarantee the material and workmanship of each piece we make and will gladly replace goods faulty in either of these respects.

READ THIS: **Our Latest Catalogue contains beautiful illustrations of our telephone specialties. It will enable you to select the devices adapted to your requirements. It's free on request.**

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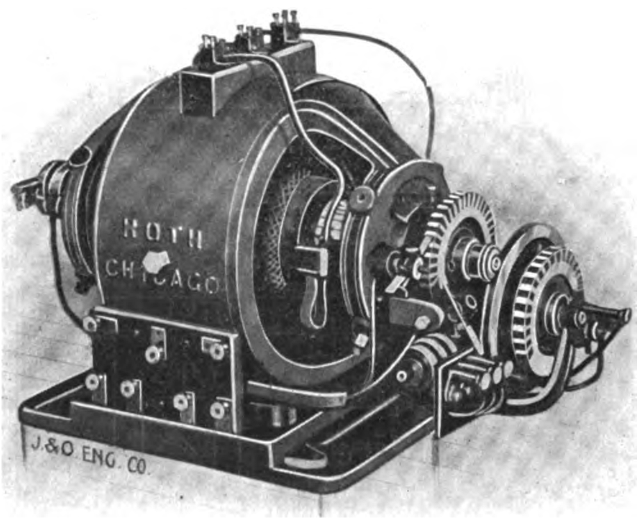
THE SATISFACTORY OPERATION OF A PLANT DEPENDS UPON



the quality of the appartus and material used in its construction. Not the least important part is the POWER PLANT. It must be economical in operation, simple in design, and yet possess all the features of high grade design. When selecting a machine or machines to fit your requirements, you can do no better than by purchasing

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(Patented August 9, 1904)

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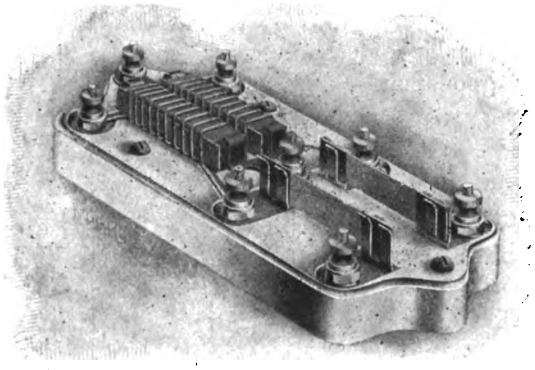

No. 2000

FOR THE PROTECTION OF ELECTRICAL APPARATUS FROM LIGHTNING DISCHARGES

Send for Bulletin 385

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MERITS YOUR ORDERS

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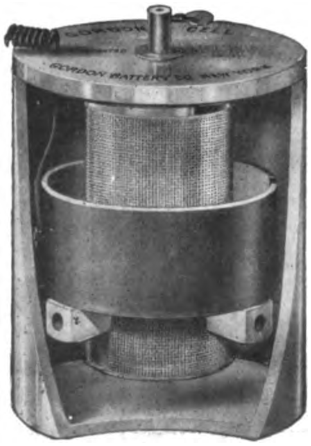

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High and constant available E. M. F.
Long life. No local action.
Will not freeze.
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In fact, they are by far the best cells on the market for telephone work.

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It's an education in electrical energy for telephony

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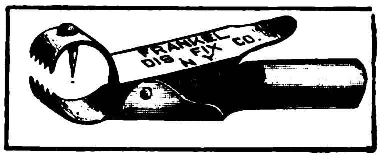
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Patented Nov. 15th, 1904.

Why not let us have your order now and save yourself time and trouble before the next storm troubles you?

Sample Dozens, $1.50 per Dozen — *500 lots, $ .10 each*
100 lots, .11 each — *1,000 " .09 "*

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BOSTON. NEW YORK. PHILADELPHIA. CHICAGO. ST. LOUIS. SAN FRANCISCO.

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VOLUME XI *SATURDAY, JUNE 24, 1905.* *NUMBER 25*

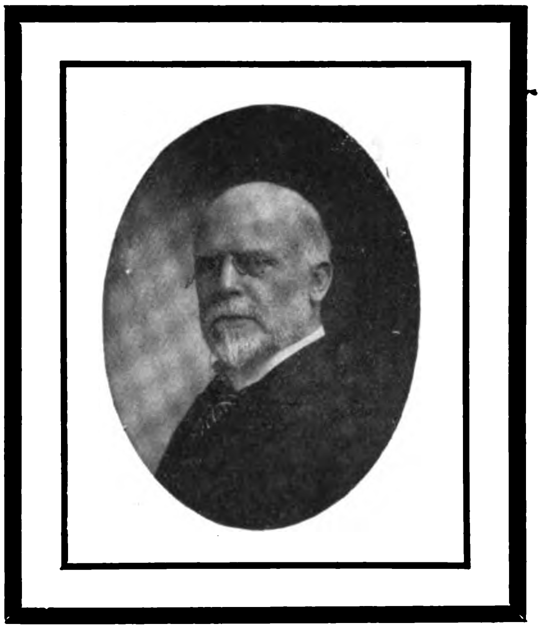
Death of S. P. Sheerin at the National-Interstate Convention

Proceedings Suspended Half a Day Out of Respect to His Memory

THE opening of the National-Interstate Telephone Convention at Chicago was arrested Tuesday morning by the death, under most tragic circumstances, of Simon P. Sheerin, of Indianapolis, Ind. Mr. Sheerin had been one of the most active figures in the new movement that led to the consolidation of the National and Interstate Association. As president of the New Telephone Company, of Indianapolis, and as a pioneer in the Independent movement, he wielded a powerful influence in the operators' ranks. His large experience in politics, obtained as secretary of the National Democratic Committee, made his co-operation invaluable when the re-organization of the two Independent associations was undertaken last year on broad, representative lines. It was natural, then, that he should have been one of the most conspicuous figures at the great telephone meeting that convened at the Chicago Auditorium Tuesday, and his colleagues selected him as their spokesman to respond to the address of welcome tendered by the representative of the mayor of Chicago.

It was here, at his post, on the platform of the convention, in the presence of five hundred of his friends and followers, that Mr. Sheerin died. He was in the heart of his address, facing the great audience, when suddenly his voice gave way. He swayed a moment unsteadily on his feet, and then he fell to the floor. In half an hour he was dead of apoplexy.

No man could have wished for a finer ending. He died, literally, in the thick of the fight, for the cause that he loved. Under any circumstances, even if it had been only an ordinary business convention that he was heralding into existence, Mr. Sheerin's taking off was such as all strong men must covet. But with him it was even better. For it was not an ordinary business meeting that he was leading. He was at the head of an army of Independent fighting men battling against an enemy who had tested his courage and loyalty and ability for nearly ten years. Mr. Sheerin himself, could he have chosen, would have selected such an end. Only a few days before he had given the crowning proof of his true-heartedness to the Independent cause by voicing his opinion of a traitor who had sold out the Independents in four Indiana counties. This traitor had been one of Mr. Sheerin's closest friends and business associates. But, when the man showed himself false, Mr. Sheerin did not hesitate a moment between friendship and duty. He publicly proclaimed his scorn and contempt of the traitor, and withdrew himself from all association with him. To those who know how strong and sincere Mr. Sheerin was in his friendship, it will not be difficult to measure the pain it cost him to throw this man off. The only question is how much the strain had to do with his sudden death.


The Late Simon P. Sheerin.

The Independent telephone men of America will not be alone in their shock and grief over the death of this man, whose work meant so much for them. His fame was national. He was born in Dublin, Ireland, Feb. 14, 1846. His father, an Irish revolutionist, left Ireland for the United States in 1849, landing at New Orleans. Later the family located at Dayton, Ohio. In 1875 Mr. Sheerin became the editor of the Logansport *Pharos*, one of the important Democratic papers of Indiana. He entered practical politics and at

THE NEW OFFICERS OF THE NATIONAL-INTERSTATE ASSOCIATION

JUST ELECTED AT THE CHICAGO CONVENTION

PRESIDENT	VICE-PRESIDENT	SECRETARY
JAMES B. HOGE	**THEODORE GARY**	**A. L. TETU**
SECOND VICE-PRESIDENT	TREASURER	ASSISTANT SECRETARY
JOHN VAN LIEU	**J. G. SPLANE**	**JOHN A. HARVEY**
California	Pennsylvania	Ohio

EXECUTIVE COMMITTEE:

Ed. L. Barber	Ohio	John Van Lieu,	California
W. D. Barnard.	Pennsylvania	George W. Beers,	Indiana
J. D. Powers,	Kentucky	Richard Valentine,	Wisconsin
Theo Gary,	Missouri	Charles C. Deering,	Iowa

COMMITTEE ON LITIGATION:

Dwight E. Sapp,	Ohio
Breckenridge Jones,	Missouri
E. B. Clement,	Wash., D. C.
J. B. Ware,	Michigan

President, Jas. B. Hoge.

Vice-President, Theodore Gary.

Secretary, A. L. Tetu.

the Democratic National Convention, held in St. Louis in 1888, Mr. Sheerin was elected a member of the National Committee, and in the same year in Washington he was elected Secretary of the National Committee. He was re-elected Secretary of the National Democratic Convention in 1898.

Mr. Sheerin organized the New Telephone Company of Indianapolis, Ind., now the Indianapolis Telephone Company, of which he has always been president, in 1897. He organized the New Long Distance Telephone Company in 1898 and the Indiana Independent Telephone Association in the same year. In 1903 he organized local companies at Columbus, Martinsville, Noblesville, Lebanon and Cicero, Ind.

Proceedings in Detail of the National-Interstate Association

THE National-Interstate Telephone Association held its first meeting at the Auditorium Hotel in Chicago, June 20 and 21. The session began Tuesday morning and the convention adjourned Wednesday evening as far as its formal deliberations were concerned. It was the largest representative gathering of Independent telephone men ever assembled. Those who composed it were men of an unusually high order, and the proceedings throughout were characterized by dignity, harmony and fidelity to Independent ideals. The tragic death of Hon. S. P. Sheerin, of Indianapolis, which occurred in the convention hall, served to restrict the deliberations and cast a profound gloom over what otherwise would have been the most successful convention ever held in the history of Independent telephony.

When James B. Hoge called the convention to order Tuesday morning there were some four hundred delegates on the floor. Mr. Hoge announced that the Executive Council had selected Colonel J. D. Powers, of Louisville, Ky., for temporary president. Colonel Powers at once took the chair until relieved by his permanent successor.

Mayor Dunne, of Chicago, was to have delivered a welcoming address. He was unable to be present, and was represented by Corporation Counsel Taylor, who, on behalf of the mayor, welcomed the delegates to the city.

Mr. Sheerin had been selected to formally reply to the Mayor's address. He was introduced by the chairman as one of the best known and most prominent men in the Independent field. He arose in the midst of enthusiastic applause, his face fairly beaming with appreciation of his reception. He looked hale and hearty, although advanced in years; in fact, he had that very morning been rejoicing at his good health. Mr. Sheerin paid the Mayor's representative a graceful compliment, then taking up his prepared address, began to read. He referred to the close relation between the Independent movement and the city of Chicago. "Of the $250,000,000 invested in the business," he said, $75,000,000 had been spent for telephones, switchboards and other equipment, and of this amount it is safe to say that 80 per cent has been expended in Chicago."

A dozen sentences had not been spoken when he was seen to falter. He turned to Colonel Powers with the words, "Mr. President," and seemed to be groping for a chair. Then scarcely before anyone realized it he fell. In an instant the convention was in confusion. All that was possible was done for the stricken man, but although the spark of life lingered a half hour or more, it was imposible to revive him.

A prolongation of the session was out of the question, and the Chair announced the convention would stand adjourned until 3 o'clock. At that hour the delegates reassembled and the Chair announced the names of the temporary secretaries: A. L. Tetu, of Tennessee, secretary, and Messrs. Wells, of Kansas, and Bradley, of Pennsylvania, assistants.

On motion of Mr. Hoge a committee was appointed to take proper action regarding Mr. Sheerin's death. The committee was named as follows: Jesse W. Wick, Indiana, chairman; J. B. Ware, Michigan; George W. Beers, Indiana; E. B. Fisher, Michigan; Ed. L. Barber, Ohio; E. E. Clement, Washington, D. C.; Theodore Gary, Missouri; J. D. Powers, Kentucky.

The convention had no heart to continue the business of the session beyond the appointing of a few committees to expedite the business of Wednesday, into which day the entire work of the meeting was to be crowded. It was at once decided, as a mark of respect to the deceased, and in deference to the feelings of the delegates, that the purely entertainment feature of the programme, notably the banquet set for Thursday night, be abandoned. These committees were appointed:

Amendments to Constitution—Theodore Thorward, Indiana; H. A. Price, Michigan; E. W. Dunaway, Texas; W. G. Thompson, Ohio; P. T. Spencer, California.

Credentials—J. G. Splane, Pennsylvania; Richard Valentine, Wisconsin.

Nominating Committee—Stanley S. Lichty, Iowa; W. Roy Mc-

SUMMARY OF THE MOST IMPORTANT WORK ACCOMPLISHED BY THE CONVENTION.

Before adjourning, the convention decided unanimously to put into effect at once a strong central organization on behalf of all the independent operating companies forming the association. The President and Executive Committee were authorized to go ahead and effect such an organization and employ such assistance as might be deemed advisable. The expenses of this organization will be borne by special contributions and by assessments upon the several companies comprising the association, the assessment not to exceed one cent per telephone per year. It is the intention of the officers and members of the association to push the offensive and defensive measures to the fullest limit within the coming year. To this end, expert organizers will be detailed to confer with the central organizations in the different States and help perfect each of the State bodies.

The recent order of the Postmaster General regarding the use of only one system of telephones in the post offices in certain sections of the country was also discussed, as well as the attitude of the railroads and express companies operating in different localities. These matters were all referred to aggressive committees who will give the matters prompt attention.

The fight over the standardization of toll signs was carried on the floor of the convention, and after a spirited but friendly contest it was decided to retain the red, white and blue shield sign, which was adopted some time ago by the conference committee of the Long Distance Companies. There was a feeling that the shield should be retained, but only printed in two colors —blue and white, but an overwhelming majority of the delegates present favored the red, white and blue.

The Executive Committee, it is stated, will make arrangements immediately for the opening of headquarters for the press, for the collection, preparation and assimilation of news of general interest to all the Independent companies throughout the country, so that they may conduct their business with full knowledge of the condition and success which attend the efforts of their associates. In this connection an advertising bureau will be instituted, the province of which it will be to prepare suitable advertising of a general nature and applicable to the needs of the different members of the association. This is right along the line of the closer and more militant organization, the need of which has been so keenly felt by the Independent operators for some months past.

A resolution introduced by the Press Committee extended the freedom of the convention to the associated press, the Scripps-McRae Press Association, the City Press Association, the press of Chicago and the technical press of the country affiliated with the art of telephony.

Canne, Missouri; W. Gilbert Thompson, Ohio; E. B. Fisher, Michigan; J. C. Harper, Wisconsin; Charles E. Wells, Kansas; P. Kerr Higgins, California; A. C. Davis, West Virginia; H. K. Cole, Kentucky; S. B. Rawson, New York; W. L. Moellering, Indiana; E. W. Dunaway, Texas; E. R. Conklin, Illinois; W. H. Bryant, Alabama; and E. E. Clement, District of Columbia.

To meet a like committee of manufacturers association, for the good of the combined order, a committee composed of E. L. Barber, Ohio; J. G. Splane, Pennsylvania; Richard Valentine, Wisconsin; C. Y. McVey, Ohio; O. C. Snider, Mo., was appointed.

WEDNESDAY'S PROCEEDINGS.

On reassembling Wednesday morning, Col. Powers as Chairman briefly and touchingly alluded to the sad event of the day before and called for the report of the memorial committee. This report was an extended memorial and eulogy of Mr. Sheerin, setting forth his long and successful career, his many virtues and his prominence in the telephone world. The report was adopted in silence by rising vote. The two Indiana members of the committee were afterward instructed to purchase a suitable floral piece for the funeral, which was held Friday at Indianapolis.

This sad duty having been completed, Col. Powers arose and with true Southern eloquence called attention to the necessity of expediting the business of the session as far as possible. He urged the delegates to stand shoulder to shoulder, elbow to elbow, as firm as a stone wall, against the opposition and in the interest of the Independent movement. The report of the nominating committee was then called for.

The committee named as permanent officers of the association for the year: President, James B. Hoge, of Ohio; first vice-president, Theodore Gary, of Missouri; second vice-president, John Van Lieu, of California; secretary, A. L. Tetu, of Tennessee; treasurer, J. G. Splane, of Pennsylvania. As each name was announced it was greeted with enthusiastic applause. The Chair was instructed by rising vote to cast the ballot of the convention for each of the men named.

When President Hoge took the chair he was greeted with a round of applause. He thanked the convention for the honor extended to him and his colleagues. He had found excellent co-operation in the organization of the association. If the same co-operation should be continued, together with the harmony manifested, and the united action of all officers of state and district associations, the convention next year would be a record breaker.

Mr. Fisher called attention to the fact that the first president of the National Association, Hon. James M. Thomas, of Ohio, had died some time previous and moved that a committee be appointed to prepare a suitable memorial.

The motion prevailed and then the following were named as the committee: Dwight B. Sapp, of Ohio; E. B. Fisher, of Michigan; F. L. Beam, of Ohio; George W. Beers of Indiana; Burt G. Hubbell, of New York.

On account of the restricted time it was decided to listen only to those papers which seemed to demand discussion. The others were ordered filed with the minutes. The papers filed were: "The National Interstate Telephone Association," James B. Hoge, Ohio. "Combined Telephony and Telegraphy," Samuel G. McMeen, of Chicago. Both of these papers appear on following pages.

While the convention was waiting for the reading of the first paper Mr. Bradley of the committee on the Standardization of Accounting read a carefully prepared report. Mr. Young, of Ohio, suggested that it might be well to have the committee provided for, also take up the question of publishing a series of standard blanks and books in accordance with the suggestions in the report. He moved that the committee be authorized to do so. The report provoked some discussion, the consensus of opinion being that it would not be wise at this time to adopt any system of bookkeeping. The motion was therefore laid on the table. Mr. Laubach's paper on "Standard Toll Signs," which is abstracted on a following page, was read. As soon as the reading was finished the president asked for a report of the advertising committee which had been working along similar lines.

A motion to adopt the report of this committee called out an extended discussion. Mr. Higgins, of California, said that his State would not object to the shield if it were permissable to add certain words to the emblem which would be distinctive of the California company. An explanation was made that there had been no intention to restrict the emblem to the wording shown in the sample. The idea was to secure a uniform emblem which, when seen, would at once suggest the fact that here was an Independent telephone company ready to do business; just as the blue bell suggested the Bell Telephone Company, although it is used with various distinctive names.

W. C. Polk, Kansas City, Mo.

C. H. Judson, Council Bluffs, Ia.

Mr. Fisher, of Michigan, and Mr. Holdoegle, of Iowa, each made a hard fight for the adoption of the emblem already adopted by their State association. Iowa uses a blue Maltese cross and Michigan a blue and white shield. It was contended by these men and others that a blue and white sign would be much more conspicuous than the three colors, red, white and blue. Mr. Fisher said that his State association had made a study of the matter and was satisfied that blue would be altogether the most conspicuous. He urged, moreover, that an effort was being made by the Independents to invade Canada, and at the present time the United States colors might not prove as popular in that country as he hoped they might be later.

A motion was made by Mr. Hood, of Ohio, that the shield recommended by the committee be adopted as the emblem of Independent Telephony. There was more discussion, which was finaly cut off by a motion by Mr. Sapp to the effect that the matter be referred back to the committee for further consideration, the committee to report later in the day. This motion was carried.

The secretary read the excellent paper on "Value of Telephone Securities," which had been prepared by A. B. Greenshields, of Philadelphia, a man of large experience in banking and the placing of securities. Mr. Greenshields' paper appears on another page of this issue.

At the conclusion of the reading Mr. Fisher was on his feet. He said that he considered the paper the clearest and most admirable document that had ever been presented in a convention of that character, and moved that the president be instructed to officially convey the thanks of the convention to the writer of the same. The motion prevailed.

A discussion of the paper followed, in the course of which Mr. Gary, of Missouri, stated that he had had some experience in financing small industries. He found after some experience that he had been going at the matter in the wrong way. In order to be a success, he said an issue of bonds must provide some way for future maintenance and growth. Investors must be satisfied as to the permanency of the proposition.

E. E. Clement, chairman of the Committee on Standardization of Equipment, read his report, which was adopted.

Mr. Fisher stated that in view of troubles which had come upon the Indiana Association he felt it would be no more than right for the State to be represented on the new Executive Council, and asked the president to carefully consider the matter in making his appointments. The Chair promptly announced that the last promise he had made Mr. Sheerin the morning before he died was that he would appoint an Indiana man to the Council; it would be both a duty and a privilege to do so. Recess was then taken until two o'clock.

Afternoon Session

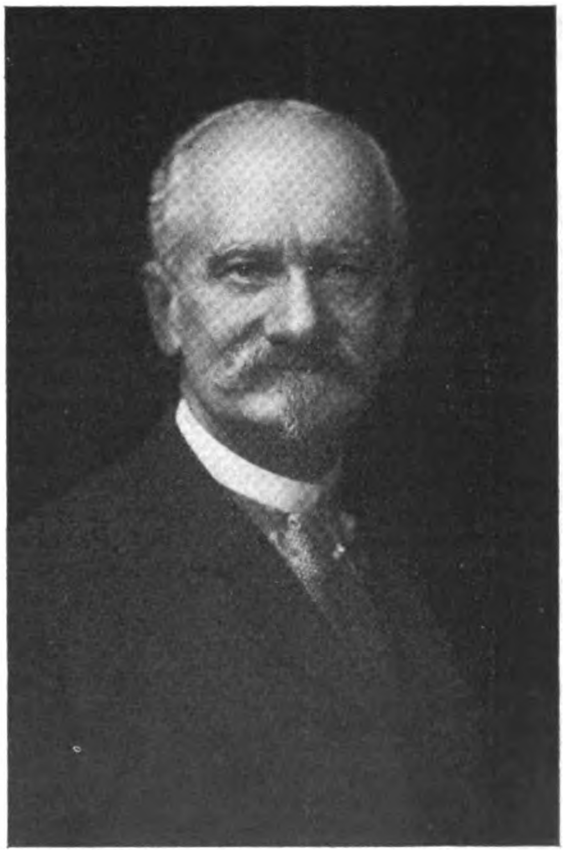
The convention reassembled at two o'clock and listened to a roll call of States for the purpose of receiving reports of progress in the different parts of the country. The reports in brief were as follows:

Alabama—No State organization but the Independent movement in fine condition.

California—An association known as the California Independent Association was recently organized with 40,000 telephones and about 20 companies. An application has been made for a franchise in San Francisco. There are 20,000 Independent telephones in Los Angeles and the same proportion to population exists in other parts of Southern California. Telephone securities in the State stand A No. 1.

Illinois—The Independent movement is making great progress. The field is practically organized on the district plan and there will be a State meeting in August.

Indian Territory—The Chickasaw Telephone Company has five exchanges and 250 miles of toll lines.


Frederick S. Dickson, Cleveland, Ohio.

Iowa—A State association was formed in 1896. There are now about 220,000 Independent telephones. Of all the exchanges 87½ per cent. are Independent. Toll service is from 25 per cent. to 50 per cent. better than the Bell's anywhere in the State.

Kentucky—There has never been a time when the outlook for

MANUFACTURERS' EXHIBITS

WE regret to announce that the description of the Telephone Manufacturers' Convention exhibits, which was prepared by our correspondent, was destroyed in the wreck of the Twentieth Century Limited Wednesday night, at Mentor, Ohio. In view of the fact that the Exhibitors removed their displays immediately at the close of the Convention, it was impossible to duplicate an accurate report of them. It was necessary to transmit all of the Convention news matter by wire in order to insert it in this issue.

the Independent movement was as good as at present. It is difficult to keep up with orders especially in farming districts.

Michigan—There are 70,000 Independent telephones in service in the lower Peninsula and some successful companies in the Upper. The Independent movement has recently been reorganized and the State Association has been found very useful in defeating hostile legislation.

Minnesota—Conditions are satisfactory. Toll service is being extended in all parts of the State and to adjoining States.

Mississippi—There is no State organization but it is hoped that there will be one before the next meeting.

Missouri—The Independent movement has shown a great growth and financial conditions have improved materially.

Nebraska—The Independents are getting to be fairly strong. There are Independent plants established or in the course of construction in every town of importance except Omaha. There are more Independent telephones in operation than the Bell has. Some good toll lines are being built.

New York—The convention of the State Association was held last week and some 150 members were present. It was predicted that within two years enough Independent telephones would be in operation in New York City to bring the total of the State to a number in excess of that in any other State in the Union.

Ohio—After ten years there are 336 incorporated Independent companies in the State; 638 exchanges; 196,000 telephones and 17,000 stockholders. Over 220 delegates and nearly as many stockholders attended the last State convention.

Pennsylvania—September 27, 1904, the first State Association was organized. There are now 93,774 Independent telephones in use, 24,000 of which are in Philadelphia.

South Dakota—Has a State organization, not large but made up of men who are trying to develop the telephone field and develop it right. There is one district association composed of eight companies and growing rapidly.

Tennessee—A representative of the Nashville Chamber of Commerce argued that the Independents were making a hard fight in that State and it would be of material benefit to them if the next meeting of the convention could be held at Nashville.

Texas—The young State Association is making good progress. After a two year's fight a franchise has finally been secured in Dallas.

West Virginia—A State Association was organized last month with twelve companies representing 13,000 telephones. The Independent movement is in a healthy condition. There are 17,768 more Independent telephones than the Bell has in the same territory and 2,000 more miles of toll lines. Altogether 64 Independent companies are operating in the State.

Wisconsin—Independent exchanges are growing rapidly. There are five times as many Independent telephones as Bell used outside of Milwaukee, where there is no Independent service. Through Independent influence a bill recently passed the legislature making it unlawful to discriminate in telephone rates among cities of the same class.

Mississippi—A similar law is in operation and in addition a company is required to submit the matter to the railway commission before rates are changed.

Indiana—There are two State Associations; at least 166,000 Independent telephones against 30,000 Bell.

Mr. Newell, of St. Joseph, Missouri, arose to make a statement. He had seen it intimated in the public press that his company might sell out, presumably to the Bell people. "God knows," he said, "the Bell people could not buy me out for a million dollars." The announcement was greeted with cheers.

The following named places made application for the next meeting of the association, the selection of which was left to the Executive Committee: Atlantic City, Detroit, Put in Bay, Nashville, Niagara Falls, Cleveland.

The committee appointed to prepare suitable resolutions concerning the death of the late Judge Thomas reported through its chairman, Mr. Sapp, of Ohio. Mr. Sapp preceded the reading of the resolution with a very eloquent and earnest spoken tribute. The resolution, deploring the loss of Judge Thomas was adopted by rising vote, ordered spread upon the records and a copy sent to the widow.

The Committee on Rules and Regulations submitted a lengthy report which was ordered printed without reading.

The secretary called the roll of States for nominations for members of the Advisory Board. The following States responded:

Michigan—E. B. Fisher.
Missouri—Theodore Gary.
Nebraska—T. H. Polluck.
Ohio—Frank L. Beam.
West Virginia—J. Walter Barnes.

The nominees were elected and the selection of the balance of the Board was left to the Executive Council.

The Committee on Advertising reported that after much deliberation it had determined to let its former recommendation regarding the adoption of an emblem stand as the will of the committee. The emblem recommended was a shield bearing the national colors. The report was presented by Mr. Hudson, chairman of the committee.

The complete report of the Committee on Advertising was adopted.

On motion the matter of securing a representative body of delegates to attend the funeral of Mr. Sheerin at Indianapolis Friday was left to the president.

After some discussion in favor of prosecuting an active campaign for the extension of Independent telephony during the coming year and raising $10,000 or $12,000 for the purpose, on motion of Col. Powers the convention adjourned sine die.

Thursday was devoted to an inspection of the exhibits by a large number of delegates who remained over for the purpose.

Report of Committee on Standard Forms of Accounting

THE committee on standard forms of accounting has given careful consideration to the accounting subject, and although it realizes that the various conditions existing in the different telephone companies throughout the country, make it almost impossible to lay out an absolutely uniform system of accounting, it is of the opinion that the following outlined system will at least give a very valuable working basis, and can be enlarged on and carried out in more detail to suit local conditions, and if accounts are properly kept along the lines laid out, will enable any company to render an intelligent statement of its affairs.

It should also be realized by the members of this convention that a standard system of accounting cannot be formulated with the expectation that all companies will immediately change their present method without a thorough examination of the advantages of a new system; and we recommend that a permanent committee of three or five members be appointed to consider suggestions for the improvement of the system, making such changes as may be necessary from time to time and to act as an advisory board.

It recommends that the accounts kept in a general ledger be divided into four main groups; i. e., Construction, Operating, Maintenance and General Accounts. The following is a synopsis of all general accounts to be used in connection with this system:

1. Plant. 2. Building and real estate. 3. Accounts received (rentals, etc.). 4. Unexpired insurance. 5. Unexpired directory. 6. Interest on bonds. 7. Treasury stock. 8. Treasury bonds. 9. Construction. 10. Maintenance. 11. Operative expense. 12. General office expense. 13. Salaries and wages. 14. Freight and cartage. 15. Bank accounts. 16. Stable expense. 17. Warehouse supplies. 18. Furniture and fixtures. 19. Petty cash. 20. Tools. 21. Discounts, concessions, etc. 22. Officers' and clerks' salaries. 23. Collecting. 24. Soliciting. 25. Taxes. 26. Insurance. 27. Light. 28. Heat. 29. Water. 30. Legal. 31. Damage and accident. 32. Stationery, printing and postage. 33. Advertising. 34. Directory. 35. Traveling. 36. Pole and right of way rentals. 37. Interest. 38. Capital stock. 39. Bonded indebtedness. 40. Unearned rentals. 41. Surplus. 42. Bills payable. 43. Accounts payable (vouchers, etc.). 44. Accrued interest on bonds. 45. Accrued taxes. 46. Unclaimed wages. 47. Earning accounts (rentals, tolls, etc.).

The accounts as above listed represent the complete ledger accounts excepting subdivisions under the headings of construction, maintenance, and operating, as will be hereafter listed. It should also be understood that accounts Nos. 22 to 37 inclusive are general expense accounts, and in many cases portions of the different charges to these accounts will be transferred or prorated to the subdivision accounts under construction, maintenance, or operating expenses, as they may apply. For instance, account No. 24, entitled "Soliciting," should only be charged with that portion of the cost of soliciting which is employed in the maintaining of present business. That portion of the cost of soliciting employed in gaining new business to be charged to the subdivision "Soliciting" under construction. The same will apply to damage and accident, legal, traveling and interest.

The following is a list of the subdivision accounts under the heading of construction:

Construction.

(A) Pole Lines: This account to include the cost of poles, cross arms, insulators, hardware and all sundry material; including also the cost of setting and painting poles, freight, cartage, wages and cost of handling.

(B) Wires and Cables: This account to include the cost of all circuit wire, tie wire, drops, house brackets, cable, cable hangers, sleeves, cable terminals, and all labor employed including freight and cartage, up to and including the house bracket.

(C) Interior Wiring and Equipment: To this acount will be charged the cost of complete telephone instruments, house cable, covered wire, office wire, inside fittings, junction boxes, lightning arresters, and all labor employed in installing same.

(D) Subways: This account to include the cost of manhole frames and covers, eye beams, conduits, cement paving, latteral bends, lumber, and all freight, cartage, labor and sundry materials used in the construction of subways.

(E) Exchange Equipment: This account to include the cost of new switchboard, cable, cross-connecting board, storage batteries, charging machines, ringing machines, freight, drayage, and the labor in installing same at the central exchange. This account to be used when plant is extended or improved and in no case should be confused with repairs to exchange equipment under maintenance.

(F) Booths and Pay Stations: This account to include the cost of all booth, coin boxes, signs and fixtures installed at central offices and pay stations, freight, drayage and labor employed.

(G) Private Branch Exchanges: This account to include the cost of private exchange, switchboard, and the cost of installing complete; and the complete cost of inter-communicating systems, including labor and all materials used, all interior wiring and telephones installed in connection with private exchange switchboards to be charged to subdivision C under construction.

(H) Soliciting: Charge salaries of solicitors for extension of plant as represented by the net gain in telephones. That is to say, if one hundred telephones are installed and fifty telephones taken out during a month at a soliciting cost of $100, charge $50 to construction and $50 to maintenance. Subscribers' changes to be considered as take-out.

(I) Right of Way: This account to include the cost of all rights and permits exclusive of franchises, to construct, operate and maintain pole lines or other equipment along or over private or municipal property.

(J) Franchises: This account to include the cost of city or town franchises, granting the right to construct and operate telephone lines and systems and extensions of original property, including all expenses incidental thereto.

(K) Toll Lines: This account to include the cost of all circuits and pole lines, including labor, freight hauling and sundry materials erected strictly for toll purposes.

(L) Construction Salaries: Charge to this account all salaries applicable to construction work which cannot be distributed in the foregoing subdivision.

(M) Construction Expense: Charge to this account all miscellaneous items of expense not directly covered by any other subdivision.

Note: Further subdivisions of cost of construction may be made if deemed necessary.

Maintenance.

(A) Repairs to Pole Lines: This account to include the cost of repairs to and replacements of materials as listed under constructions, including freights and hauling and all cost of labor employed.

(B) Repairs to Wires and Cables: This account to include the cost of repairs to and renewals of materials as listed under this heading in construction, including freight, hauling and all labor employed.

(C) Repairs to Interior Wiring and Equipment: This account to include the cost of repairs to and replacements of materials as listed under construction including freight hauling and all cost of labor employed.

(D) Repairs to Subway: This account to include the cost of repairs to and replacements of materials as listed under construction, including freight and hauling and all cost of labor employed.

(E) Repairs of Exchange Equipment: This account to include the cost of material and supplies for the repair of the switchboard, cable, cable shaft and terminal room, distributing board, cross-connecting frame, repairs to charging machines.

T. B. Lee, Pennsylvania.

W. H. Durin, Iowa.

C. E. Wilson, Pennsylvania.

ringing machines, batteries and the renewal of batteries and all labor employed.

(F) Repairs to Booths and Pay Stations: This account to include the cost of repairs to and replacements of materials as listed under construction, including freight, hauling and all labor employed.

(G) Repairs to Private Branch Exchange: This account to include the cost of repairs to and replacements of materials and equipment as listed under construction, including freights, hauling and all cost of labor employed.

(H) Repairs to Buildings: Repairs to company's buildings.

(I) Tool Repairs: To include the cost of all tools when purchased to take the place of tools destroyed or lost and repairs.

(J) Miscellaneous Expense: To provide for all repairs not otherwise specified.

(K) Repairs to Toll Lines: This account to include the cost of repairs to and replacement of material as listed under construction, including freight and all cost of labor employed.

Operative.

(A) Salaries and Wages, Local Exchanges: Operators, supervisors, monitors, attendants, etc.

(B) Salaries and Wages, Long Distance: Toll operators, supervisors, monitors, attendants, etc.

(C) Stationery, Printing and Postage: This account to include the cost of all stationery, printing and postage used in the operating department for compiling records, monthly and daily reports, etc.

(D) Light: This account to include a fair pro rata of total light bills, which is considered applicable to operating according to existing conditions. Balance of light bills to be charged to the general expense account "Light."

(E) Heat: Charge a fair pro rata of total heat bills, which is considered applicable to operating according to existing conditions. Balance to be charged to the general expense account "Heat."

(F) Water: Charge a fair pro rata of total water bills to this account as in the case of light and heat.

(G) Power: Charge entire power bill to this account.

(H) General Operating Expense: This account to include the cost of expense of dining room supplies, hospital, hospital supplies, medical services, traveling expenses and other items incident to the operating department. In the event of meals being sold to operators or other employes, the proceeds to be credited to this account.

(I) Rent: A proportionate amount of rent applicable to operating department.

H. E. Bradley, chairman; C. J. Meyers, secretary; Charles F. Bender, Charles West, W. W. Grayson, N. S. Vivian, J. B. Ware, P. T. Spencer, H. B. Sale, W. Van Middlesworth, committee.

Report of Committee on Standardization of Equipment

The Committee on Standardization of Equipment reported as follows:

The committee organized June 19th by the election of Edward E. Clement, of Washington, D. C., as Chairman, and W. C. Polk, of Kansas City, Mo., as Secretary. The following members were present in person or by representative: W. C. Polk, in person; O. H. French by C. Y. McVey, of Cleveland, O.; Edward E. Clement, in person; George W. Beers, in person; C. E. Wilson by Jno. W. Kelly, Jr., Philadelphia, Pa.; Edmund Laud, in person; John A. Armstrong, in person; R. S. Redman by C. H. Judson, Council Bluffs, Ia. The following were absent: Sidney H. Browne, C. H. Ledlie, M. H. Clapp, J. J. Comer. The duties of the committee were, to investigate means looking toward a systematic standardization of equipment.

After much discussion the committee decided that the subject committed to it would require much time and work, since the opinions of State bodies and of operating as well as manufacturer's engineers must be obtained before any successful attempt at formulation of standard rules or specifications could be made.

The following was therefore unanimously adopted:

"*Resolved,* That the association should and is hereby recommended to constitute a permanent Committee on Standardization of Equipment, whose duty it shall be to gather information from the various State organizations and operating companies and to consult with the manufacturers, to the end that they may report to the association or the Executive Committee for adoption a set of standard rules and specifications. It is the sense of this committee that the best interests of the association would be subserved, and the work of standardizing facilitated by the establishment and maintenance of a central and National Bureau of Engineering, Testing and Experimental Work, in short an Association Laboratory, for reliable expert reports and opnions. This should preferably be supported by subscriptions or by fees, or both."

Report of Committee on Best Methods of Advertising

THE committee to whom was referred the matter of "Best Methods of Advertising" was not certain just what scope it was intended should be covered. The subject is so broad that one is easily lost in a labyrinth of speculation.

The committee was unanimous in the opinion that a system of publishing throughout the country in both the press and by pamphlets, facts judiciously setting forth the progress and stability of the Independent telephone business, could be handled so as to be of incalculable benefit, and place the business in a position to command the attention and support it deserves and needs.

No other enterprise undertaken in this country, approaching in magnitude the telephone industry, can point to the phenomenal growth and unvarying success that has characterized the telephone business. The percentage of defalcation will compare favorably with other leading branches, including banking, mercantile and railroad enterprises, and failures have been practically unheard of. Hence, we insist that proper presentation of the business, persistently kept before the public, immeasurably increases the business and convince the financial world that no industry is more stable and secure.

We are informed by a member of this convention that only recently the opposition published a report at a critical point in Nebraska, that a certain plant of some prominence in Texas had defaulted and gone to the bad, the inference being that the Independent movement was unstable and would in time result disastrously to those interested. The reputed bankrupt plant appears to be one of the best and one of the most prosperous in the country, and was marching happily onward and upward while its friends in Nebraska were mourning its reported misfortunes, and its traducers were laughing over the black eye they had given the Independent movement in the locality where the report was circulated.

An efficient central authority, to whom all such reports should be sent instantly, could have promptly refuted this story, not simply in the locality where first published, but could have exposed the trick throughout the country in such a light as to have brought just contempt and odium upon its perpetrators.

In local advertising it is felt that much may be accomplished by a central bureau devoted to the business, in the way of furnishing copy and suggestions calculated to bring the system of the Independents before the public.

The committee is agreed that it is bad policy to advertise the opposition, except when it may be necessary to be personal, to correct misrepresentation or to institute comparisons, and then only in a dignified and courteous manner. By persistent, direct statement, in words and illustrations, in the press and by cards, blotters, etc., keep before the public the advantages offered by the Independent exchanges and toll lines the systems which have forced the reduction in prices of nearly one-half for both exchange and toll service.

To more effectively carry forward this work, your committee recommends that—

The Red, White and Blue Shield bearing the words, "Independent Local and Long Distance Telephone," with the stars as shown in sign now in use be adopted as an emblem to be used by all the Independent telephone people through the United States.

That an advertising or publicity bureau be established by this association under the direction of the Executive Council, who shall employ a competent man, who shall compile, prepare and publish such facts and comments as will tend to place the Independent telephone business in its proper light before the public and aid local operators as far as possible in advertising their business to the end that uniformity and general good may result.

Committee: J. A. Hudson, chairman, Columbus, Mo.; W. H. S. Houck, Erie, Pa.; G. T. Everett, secretary, Columbus, Neb.; H. A. Douglas, Cedar Rapids, Ia.; Vinton A. Sears, Boston, Mass.; E. W. Dunaway, Texas; M. B. Overly, Cleveland, O.; W. J. Melchers, Alma, Mich.

List of Delegates, Alternates and Visitors.

ALABAMA.—Bryant, W. H., Vice-President Home Telephone Company, Mobile; Zeluff, J. E., Supt. Central Telephone Construction Company, Birmingham.

CALIFORNIA.—Higgins, P. Kerr, Gen. Mgr. U. S. Long Distance Tel. & Tel. Co., Los Angeles; Spencer, P. T., Gen. Mgr. Alhambra, Downey & Whittier Telephone Co., Los Angeles; Wardman, Gus, Local Mgr. Whittier Home Telephone & Telegraph Co., Los Angeles.

COLORADO.—Paxton, George B., Denver.

DISTRICT OF COLUMBIA.—Edward E. Clement, Washington.

CUBA.—Conklin, Roland R., President Cuban Telephone & Telegraph Co., Havana; Jarvis, Samuel W., Cuban Telephone & Telegraph Co., New York office, 111 Broadway; Talbot, H. M.; Supt. Red Telephonica de la Havana, Havana.

ILLINOIS.—Bowen, L. V., Carroll County Independent Telephone Co., Savana; Conklin, A. B., Treasurer Interstate Independent Telephone & Telegraph Co., Aurora; Camp, C. A., President Henry Telephone Co., Henry; Conklin, E. R., Interstate Telephone & Telegraph Co., Aurora; Donaldson, J. H., Eaton Telephone Co., Owaneco; Farwell, Hart F., Home Telephone Co., Bloomington; Forbes, C. W., Supt. United Telegraph, Telephone & Electric Co., Chicago; Glandon, Ed. D., Secretary and Manager Pike County Telephone Co., Pittsfield; Hyneman, L. F., President Lexington Home Telephone Co., Lexington; Herrick, L. A., Stephenson County Telephone Co., Freeport; Hennis, E. C., Secretary Knox Telephone Co., Sandwich; Linville, Ross, Pike County Telephone Co., Pittsfield; Leffler, C. E., Lexington Home Telephone Co., Lexington; Miller, A. W., Manager Varna Telephone Exchange, Varna; Maxwell, A. T., Illinois Tunnel Co., Telephone Department, Chicago; Painter, George M., Chicago; Ramsey, W. H., General Manager Auburn Telephone Co., Auburn; Schuler, Albert, Streeter Independent Telephone Co., Streeter; Sabin, I. C., Auditor National Telephone & Electric Co., Clinton; Vernies, A. J., Manager Eastern Illinois Independent Telephone Co., Kankakee; Wasson, B. F., National Telephone & Electric Co., Clinton.

INDIANA.—Bromley, Thomas, General Manager Delaware & Madison Counties Telephone Co., Muncie; Bell, J. H., Manager Hoosier Telephone Co., Salem; Brown, J. A., Secretary Winchester Telephone Co., Winchester; Barnhill, O. H., Manager Winchester Telephone Co., Winchester; Beers, George W., Fort Wayne; Dorland, R. O., Secretary Laporte Telephone Co., Laporte; Koontz, C. E., Manager Breman Telephone Co., Breman; Moellering, William L., Secretary National Telephone & Telegraph Co., Fort Wayne; Harry Webster, Richmond Home Telephone Co., Richmond; Orr, D. O., Manager Attica Telephone Co., Attica; White, Frank, President Home Telephone Co., Portland; Weik, Jesse W., President Greencastle Telephone Co., Greencastle; Yarling, Dr. John E., General Manager Peru Home Telephone Co., Peru; Haus, W. W., Manager Laporte Telephone Co., Laporte; Johnston, J. R., Secretary Home Telephone Co., Elkhart.

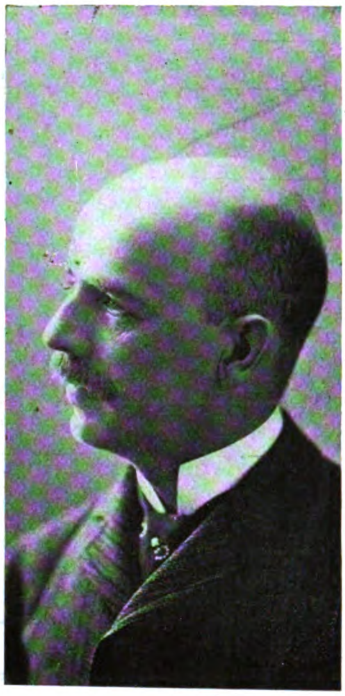
IOWA.—Albertsen, J. M., Exchange Manager Woodbine Telephone Co., Logan; Bellamy, J. S., President Mutual Telephone Co. of Des Moines, Des Moines; Bandy, Geo. N., Hawkeye Telephone Co., Des Moines; Deering, Charles C., Boone County Telephone Co., Boone; Douglas, H. A., Manager Cedar Rapids & Marion Telephone Co., Cedar Rapids; Holdoegel, P. C., Secretary and Manager Central & Mutual Telephone Co., Rockwell City; Hamm, C. S., Assistant Manager Davenport & Tipton Telephone Co., Tipton; J. S. Herr, Ottumwa; Judson, C. H., Council Bluffs Independent Telephone Co., Council Bluffs; Kinney, H. A., Woodbine Telephone Co., Woodbine; Kinney, Harvey S., Woodbine Telephone Co., Woodbine; Lichty, S. S., Secretary Corn Belt Telephone Co., Waterloo; Martin, E. H., President Martin Telephone Co., Webster City; McElroy, Geo. D., Corn Belt Telephone Co., Vinton; Mahan, L. S., Secretary La Mars Telephone Co., Lamars; Newen, E. Duke, Central Iowa Telephone Co., Iowa Falls; Plaister, Jos. M., Manager Fort Dodge Telephone Co., Fort Dodge; Reed, Harold, Woodbine Telephone Co.; Woodbine; Quinn, P. T., Corn Belt Telephone Co., Waterloo; Shoemaker, James H., General Manager Corn Belt Telephone Co., Waterloo; Stacy, F. H., Rural Telephone Co., Anito; Thomas, J. C., Jefferson County Telephone Co., Fairfield.

KANSAS.—Hemphill, W. P., Secretary and Treasurer Independent Telephone Co., Topeka; Nelson, W. H., President Exchange Telephone Co., Smith Center; Siko, Wm. F., Wellington Independent Telephone Co., Wellington; Wells, Charles E., President South Water Telephone & Electric Co., Marion.

KENTUCKY.—Armstrong, J. A., President Louisville Home Telephone Co., Louisville; Bergin, J. E., Paducah Home Telephone Co., Paducah;

Henry A. Barnhart, Indiana.

H. C. Winter, Wisconsin.



Richard Valentine, Wisconsin.

Cole, H. K., Secretary and General Manager Kentucky & Indiana Telephone & Telegraph Co., Owensboro; Powers, J. D., Vice-President Independent Long Distance Telephone & Telegraph Co., Louisville.

MASSACHUSETTS.—Sears, Vinton A., Treasurer Automatic Telephone Equipment Co., Boston.

MICHIGAN.—Britton, Geo. C., Citizens' Telephone Co., Grand Rapids; Fisher, E. B., Secretary Citizens' Telephone Co., Grand Rapids; Fildew, J. H., Secretary Union Telephone Co., Alma; Hutchins, H. H., Manager Saugatuck & Ganges Telephone Co., Ganges; Jeffrey, H. E., Manager Union Telephone Co., Mt. Pleasant; Melchers, W. J., General Manager Union Telephone Co., Alma; Land, Edmund, Citizens' Telephone Co., Grand Rapids; McPherson, R. B., President Livingston Home Telephone Co., Howell; Price, H. A., Secretary Saginaw Valley Telephone Co., Bay City; Robinson, William, Manager Citizens' Telephone Co., Muskegon; Roof, George S., Secretary and Manager Lake Shore Telephone Co., Hart; Tarte, C. E., Citizens' Telephone Co., Grand Rapids; Vivian, W. S., Manager Michigan Independent Telephone Traffic Association, Grand Rapids; Ware, J. B., Citizens' Telephone Co., Grand Rapids; Taggart, T. E., Manager Valley Telephone Co., Vassar.

MISSISSIPPI.—Goodnight, I. H., Manager Central Mississippi Telephone Co., Louisville; Wier, R. K., Starkville Telephone & Power Co., Starkville.

MISSOURI.—Bassett, Wm. H., Traffic Manager, Kinloch Long Distance Co., St. Louis; Chaney, S. E., Independent Home Telephone Co., Independence; Denison, Ernest B., Kinloch Long Distance Telephone Co. of Missouri, St. Louis; Golladay, M. W., Secretary and General Manager Holden Telephone Co., Holden; Gary, Theodore, President and Manager Home Telephone Co., Joplin; Macon Telephone Co., Macon; Merrill Telephone Co., Murrill; Grayson, W. W., Kinloch Long Distance Telephone Co., St. Louis; Haley, J. S., Secretary and Treasurer The Independent Telephone Co., Independence; Hughes, A. B., Hardin Telephone Exchange, Hardin; Hudson, J. A., President and Manager Columbia Telephone Co., Columbia; Cavinaugh, W. J., Kansas City Home Telephone Co., Kansas City; McHenry, Houck, Capitol Telephone Co., Jefferson City; McCanne, W. Roy, Secretary Kinloch Long Distance Telephone Co. of Missouri, St. Louis; Myers, C. J., Superintendent Kansas City Long Distance Telephone Co., Kansas City; Newell, J. J., President Citizens' Telephone Co., St. Joseph; Polk, W. C., Kansas City Home Telephone Co., Kansas City; Snyder, O. C., Vice-President and General Manager Kansas City Telephone Co., Kansas City.

NEBRASKA.—Burk, John T., Omaha; Everett, E. G., Secretary and Manager Platte County Independent Telephone Co., Columbus; Ewing, John M., Nebraska City Telephone Co., Nebraska City; Gesler, J. H., Manager Union Telephone Co., Mansa; Munn, A. M., General Manager Nebraska City Telephone Co., Nebraska City; Woods, Frank H., President Lincoln Telephone Co., Lincoln, President Western Telephone Co., Lincoln.

NEW YORK.—Babcock, Garrison, Vice-President Home Telephone Co., Albion; Ferris, T. Harvey, Treasurer N. Y. State Independent Telephone Association, Utica; Johnson, Shirley E., Fisk & Robinson, Bankers, N. Y.; Nuttall, H. A., Buffalo; Rawson, S. B., Albany Home Telephone Co., Albany.

OHIO.—Adams, George, Millersberg, Wooster & Orville Telephone Co., Millersberg; Barber, E. L., Wauseon; Beam, Frank L., President Ohio Independent Telephone Association, Columbus; Berry, H. A., Marion County Telephone Co., Marion; Boylan, J. P., Cuyahoga Telephone Co., Cleveland; Couden, L. C., Gallipolis Telephone Co., Gallipolis; Fee, Wm. R., New Citizens' Telephone Co., Batavia; Forrest, C. Burr, General Manager Gallipolis Telephone Co., Gallipolis; French, O. F., General Manager Cuyahoga Telephone Co., Cleveland; Grauel, C. E., Manager Panesville Telephone Co., Panesville; Herron, M. M., General Manager Millersburg, Wooster & Orville Telephone Co., Millersburg; Hilderbrant, C. L., Clinton Telephone Co., Wilmington; Horning, W. A., Chardon, Leroy & Thompson Telephone Co., Chardon; James B. Hoge, Secretary United States Telephone Co., Cleveland; Hood, Charles H., Vice-President and General Manager Tuscarawas County Telephone Co., New Philadelphia; Hollander, Charles E., Manager Newark Telephone Co., Newark; Knapp, Frank, Secretary Local Telephone Co., Norwalk; Belleview Home Telephone Co., Belleview; McVey, C. Y., Assistant General Manager Federal Telephone Co., Cleveland; Miller, H. P., General Manager Home Telephone Co., Dayton; Metheany, Geo. H., Secretary and Manager Lima Telephone & Telegraph Co., Lima; Odafer, D. M., Secretary and General Manager Marion County Telephone Co., Marion; Oberly, M. B., General Manager United States Telephone Co., Cleveland; Perdue, Morton, Superintendent Stark County Telephone Co., Canton; Reamer, Ralph, Secretary and Treasurer Ohio Independent Telephone Association, Columbus; Rhodes, J. B., Secretary and General Manager Zanesville Telephone & Telegraph Co., Zanesville; Salzscaber, G. M., President Van Wert Home Telephone Co., Van Wert; Sapp, Dwight E., Mt. Vernon Telephone Co., Mt. Vernon; Stinson, C. E., General Manager Toledo Home Telephone Co., Toledo; Chapman, F. S., Manager Kenton Telephone Co., Kenton; Taylor, Morris, Manager Eastern Ohio Telephone Co., East Rochester; Thedieck, I. H., Sidney Telephone Co., Sidney; Thorpe, Clinton, Secretary Clinton Telephone Co., Wilmington; Thompson, W. Gilbert, Manager Hamilton Home Telephone Co., Hamilton; Troutman, Otto, Millersburg, Wooster & Orville Telephone Co., Shreeve; Ward, S. E., Mansfield Telephone Co., Mansfield. French, O. F., General Manager Cuyahoga Telephone Co., Cleveland; Gibson, David, North Electric Co., Cleveland; Grauel, C. E., Manager Panesville Telephone Co., Panesville; Herron, M. M., General Manager Millersburg, Wooster & Orville Telephone Co., Millersburg; Hildebrant, C. L., Clinton Telephone Co., Wilmington; Horning, W. A., Chardon, Leroy & Thompson Telephone Co., Chardon; James B. Hoge, Secretary U. S. Telephone Co., Cleveland; Hood, Charles H., Vice-President and General Manager the Tuscarawas County Telephone Co., New Philadelphia; Hollander, Charles E., Manager Newark Telephone Co., Newark; Knapp, Frank; Secretary Local Telephone Co., Norwalk, Belleview Home Telephone Co., Belleview; McVey, C. Y., Assistant General Manager Federal Telephone Co., Cleveland; Miller, H. P., General Manager Home Telephone Co., Dayton; Motheany, Geo. H., Secretary and Manager The Lima Telephone & Telegraph Co., Lima; Odafer, D. M., Secretary and General Manager Marion County Telephone Co., Marion; Oberly, M. B., General Manager U. S. Telephone Co., Cleveland; Perdue Morton, Superintendent Stark County Telephone Co., Canton; Remier Ralph, Secretary and Treasurer Ohio Independent Telephone Association, Columbus; Rhodes, J. B., Secretary and General Manager Zanesville Telephone &

T. S. Lane, Buffalo, N. Y.

Jas. S. Barber, Wauseon, Ohio.

Theo. Thorward, South Bend, Ind.

Telegraph Co., Zanesville; Salzscaber, G. M., President Van Wert Home Telephone Co., Van Wert; Sapp, Dwight E., Mt. Vernon Telephone Co., Mt. Vernon; Stinson, C. E., General Manager Toledo Home Telephone Co., Toledo; Chapman, F. S., Manager Kenton Telephone Co., Kenton; Taylor, Morris, Manager Eastern Ohio Telephone Co., East Rochester; Thedieck, I. H., Sidney Telephone Co., Sidney; Thorpe, Clinton, Secretary Clinton Telephone Co., Wilmington; Thompson, W. Gilbert, Manager Hamilton Home Telephone Co., Hamilton; Troutman, Otto, Millersburg, Wooster & Orville Telephone Co., Shreeve; Ward, S. E., Mansfield Telephone Co., Mansfield, O.; Woodbury, W. B., Assistant General Manager Cuyahoga Telephone Co., Cleveland.

PENNSYLVANIA.—Anderson, J. N., Pittston; Bender, Charles F., Aud, Pittsburg & Allegheny Telephone Co., Pittsburg; Berg, Charles A., General Manager Maryland, Pennsylvania & West Virginia Telephone & Telegraph Co., Uniontown; Bradley, H. E., Secretary Pennsylvania State Independent Telephone Association of Philadelphia, Philadelphia; Houck, H. S., Union Telephone Co., Erie; Kelly, John W., Jr., Superintendent of Equipment, Keystone Telephone Co., Philadelphia; Latta, S. G., Vice-President Elk Telephone & Telegraph Co., Wilcox; Lee, A. W., Vice-President Huntington & Clearfield Telephone Co., Clearfield; Mayer, Charles J., Treasurer Pittsburg, Johnstown Long Distance Telephone Co., Johnstown; Shoemaker, A. C., Pittston; Splane, J. G., President P. & A. Telephone Co., Pittsburg; Schade, E. D., Secretary and General Manager Johnstown Telephone Co., Johnstown; West, Charles, General Superintendent Consolidated Telephone Companies of Pennsylvania, Allentown.

SOUTH DAKOTA.—Crothers, P. R., Division Superintendent Dakota Central Telephone Co., Brookings; Lundy, L. F., Manager Castlewood Telephone Co., Castlewood; Maxwell, C. C., Arlington, Hetland Telephone Co., Arlington; Zietlow, J. L. W., President Dakota Central Telephone Co., Aberdeen.

TENNESSEE.—Smith, N. D., Jackson Home Telephone Co., Jackson; Tetu, A. L., General Manager Nashville Home Telephone Co., Nashville.

TEXAS.—Dunaway, E. W., General Superintendent Citizens' Telephone Co., Paris; Gooch, Horace, General Manager Amarillo Telephone Co., Amarillo; Young, Brigs, President Citizens' Telephone Co., Paris; Fitzgerald, B. F., Engineer Texarkana Telephone Co., Texarkana.

WEST VIRGINIA.—Barnes, J. Walter, General Manager Consolidated Telephone Co., Fairmount; Bugley, Loyd, President Bugley Telephone Co., Neston; Davis, A. C., General Manager West Virginia Western Telephone Co., Parkersburg; Handlan, W. C., General Manager National Telephone Co. of West Virginia, Wheeling; Hutchinson, Lon H., Manager Huntington Mutual Telephone Co., Huntington, West Virginia.

WISCONSIN.—Enochs, C. B., Chief Engineer Vought Berger Co., La Crosse; Goodrich, W. F., La Crosse Telephone Co., La Crosse; Murray, J. A., Manager Baraboo Telephone Co., Baraboo; Vanmittlesworth, Wm., Manager Citizens' Telephone Co., Racine; Valentine, Richard, President Wisconsin Independent Telephone Association, Janesville; Winter, H. C., Secretary Dam County Rural Telephone Company, Dam County, Wis.; Wilder, G. W., Cambridge Telephone Co., Cambridge, Wis.; Professor Telephone Engineering Armour Institute Technology.

CANADA.—Dagger, F., Technical Assistant to Select Committee on Telephone Systems to House of Commons, Ottawa, Canada.

New York Independent Association Meeting at Albany June 16

THE New York State Independent Telephone Association held its annual meeting June 16, in the city council chambers, Albany, New York. The following officers were elected for the ensuing year: President, Howard Hendrickson, Albany; first vice-president, Boyd McDowell, Elmira; second vice-president, R. W. Campbell, Niagara Falls; treasurer, T. Harvey Ferris, Utica; secretary, T. S. Lane, Buffalo.

The executive committee for the ensuing year will be composed of W. L. Burke, Troy, N. Y.; George R. Fuller, Rochester, N. Y.; B. G. Hubbell, Buffalo, N. Y.; Edward Davis, Binghamton, N. Y.; S. B. Rawson, Albany, N. Y.; W. B. Charles, Amsterdam, N. Y.; C. H. Poole, Utica, N. Y.; C. W. Pratt, Boonville, N. Y.; F. M. Potter, Jr., Syracuse, N. Y.; J. F. Stockwell, Oswego, N. Y.; I. H. Griswold, Plattsburg, N. Y.

The following were selected as delegates to the meeting of the National-Interstate Telephone Association, which was held June 20, in Chicago: B. G. Hubbell, Buffalo; S. B. Rawson, T. Harvey Ferris, Utica.

Papers were read as follows: "Toll Line Development," T. M. Brush, Albany; "Consolidation," George R. Fuller, Rochester; "New Methods of Construction," by R. M. Eaton, Niagara Falls.

After a lengthy discussion a report of the "special traffic committee" was adopted unanimously. This report consists of a recommendation of a uniform plan of toll operating and accounting, and was compiled by T. S. Lane, S. B. Rawson and Ed. Davis, special committee. It provides for a three-minute time limit on toll messages, furnishes a complete schedule of toll rates for all distances, establishes a uniform method of division of mileage between connecting toll line companies and gives a complete method of accounting toll revenues. The adoption of this report by the State Association establishes a uniform method of handling toll business throughout the State.

At 5 p. m. the Association members became the guests of the Albany Home Telephone Company, which entertained those present with a trip down the river and a clam bake. The 1906 meeting will be held in Elmira. Seventy-eight delegates were in attendance.

The National-Interstate Association–Address by President Jas. B. Hoge.[*]

Jas. B. Hoge, *Cleveland.*

NINE months ago at a meeting in St. Louis, the National Independent Telephone Association amended its by-laws so as to form a more perfect organization. The convention was scarcely over before it was suggested from many sections of the country, that a consolidation between the National and the Interstate Associations should be effected. In December the Interstate Independent Telephone Association had its meeting. A committee was appointed to meet with the committee that had been previously selected by the officers of the National Association, and on January 19, 1905, a consolidation was agreed upon and a constitution adopted. Since that time the committee in charge has been doing what it could in an inexpensive way to bring about a better organization.

W. GILBERT THOMPSON.

Mr. Thompson is a prominent Ohio Independent. His home is in Lebanon. He was elected president of the Ohio Independent Telephone Association at its meeting in Cincinnati, February 17, 1904.

The year has recorded the death of the Hon. Jas. M. Thomas, former president of the National Association, and a prominent figure in association work. It has been one of active work for the Independent companies. A number of new franchises have been secured, and others are pending, among them being San Francisco, Cal.; Spokane, Wash.; Nashville, Tenn.; New York city and a number in New England and elsewhere. Everything now indicates, that exchanges will be built in the near future in the few remaining cities where our competitors have had a free hand to manage the business as seemed to them best, and to charge fabulous rates to assist in carrying on warfare in cities where they had competition by giving away service.

A number of the manufacturing companies supplying Independent companies with equipment have built new factories, while other factories have been enlarged so as to enable them to take care of the growth. Many consolidations have been made between companies in counties and States that were so situated, as to enable them to operate with greater economy on a consolidated basis. Each State that has an organization has in nearly every instance been divided into districts, which have sub-divided their territory between members who are fully developing them. Statistics have been gathered which will be clearly shown at the roll call of States.

Following out the plan of our constitution, committees have been appointed on the following subjects: Standard Forms of Accounting, Standard Operating Rules and Regulations, Standardization of Equipment, Best Methods of Advertising, Arrangements Necessary Between Operators and Manufacturers to Protect Independent Companies. The foregoing committees will report the results of their work to this convention.

There never was a time when the operators, manufacturers and others having interest in the Independent telephone development, appeared to be so closely in touch with each other, or to feel the importance of standing together as at present. It is of importance to all that we form a closer union, work out all economies possible and pool our interests to assist each other.

The amount of capital invested in the Independent telephone field is only about 60 per cent. of what its competitors have to represent the same number of units. This has been made possible by our entering the field after much of the expensive experimental work had been done, and also because the work was done more economically, due to local influence being able to get many privileges that a foreign owned corporation could not get at all, in some cases and in others only at extravagant prices.

The railway was first installed on a commercial basis in Great Britain in 1829, the telephone in the United States in 1876, the telephone being handled exclusively by the original inventors until the patents expired in 1894, when the Independents entered the field. It was then that the American people commenced to reap the real benefits from the invention. It has been greatly improved upon since and to-day the Independent companies are operating a majority of the telephones in the United States, the total number of telephones having increased between 1894 and 1904 over 1,500 per cent. In some States the growth has been even greater. Is it any wonder that it has kept us all busy financing to keep up with the growth? The number of passenger and freight units carried by the steam railways has increased in fourteen years 141.8 per cent., the telephone units in the United States in ten years over 1,500 per cent. or more than ten times the increase of business of the steam railways. The railways had to help develop their original business, while telephone business developed itself for the Independent companies.

It is frequently urged that the trouble with the telephone business is the enormous growth it has each year. The telephone business, like every other business, will reach a limit of development; after that time the system will grow as the territory that it serves grows, which in many cases can be taken care of from surplus earnings after paying dividends; but that point will not be reached until you have fully developed your business, just the same as well-organized street railway and gas companies have always aimed to do. After that it is a matter of putting on more cars and extending a track here or there, laying a few new mains and setting new meters connected to existing pipe lines. There is also going to be an opportunity to do many things that might be called a by-product, such as furnishing fire and burglar protection.

The engineers designing our apparatus and the manufacturers producing it have been constantly improving the service and have made it possible to give the best service to be had at a minimum cost for construction and capable of being operated at a minimum operating expense.

How can we help each other and at the same time benefit ourselves? The Independent companies have in the past met all obstacles placed in their way. They can be depended upon now.

We have heard practically every argument that can be enumerated by the combinations possible to be made by the twenty-six letters of the English alphabet, and yet nothing worth mentioning in the way of permanent damage to our cause has been accomplished. In a few instances they have made it necessary for the local people to get franchises and build new exchanges for their own protection and benefit and connect their new properties with the Independent system. A few of the notable places are Toledo, Ohio, where the Independent company was purchased by the Bell company in the late nineties and operated by it as an Independent plant for some three years. During that time it took city councils there from all over the country to show what a horrible thing duplicate telephone service was and how the Independent company was unable to succeed with Bell competi-

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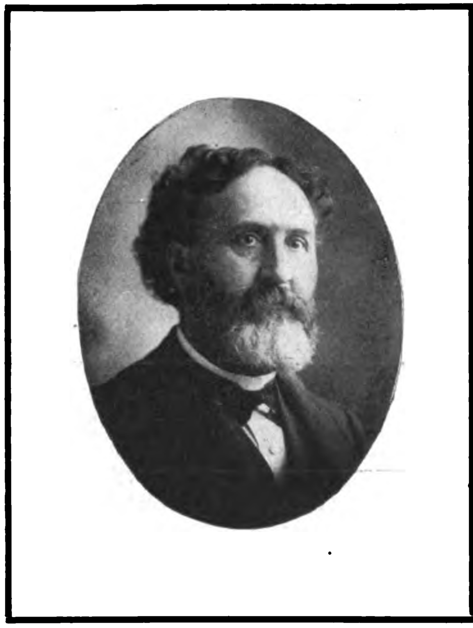
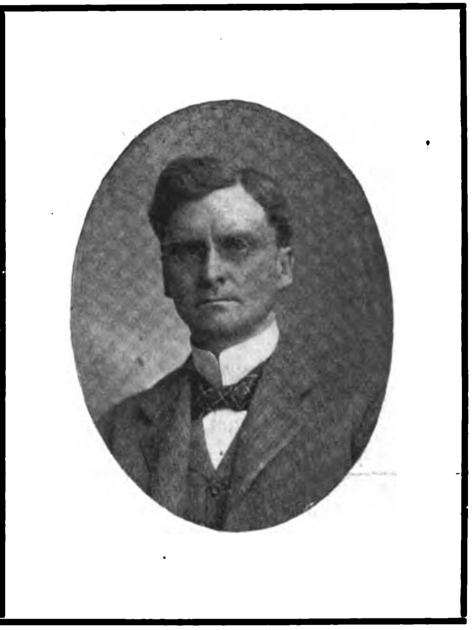
[*] Abstract of address before the first annual meeting of the National-Interstate Telephone Association, Chicago, June 20, 1905.

THREE INDEPENDENTS WHO HAVE HAD MUCH TO DO WITH EFFECTING THE NATIONAL ORGANIZATION.



E. B. Fisher, Citizens Telephone Co., Grand Rapids, Mich.

Dr. C. F. Bennett, a Prominent Independent, Waterloo, Iowa.



J. B. Ware, a Pioneer in the Independent Movement.

tion. A new Independent franchise was granted and a plant built which to-day is operating over 9,000 telephones, while the Bell company has thrown away the plant it purchased and has about 4,000 telephones left in its original exchange. Or I might cite South Bend, Anderson and Muncie, Ind., and a number of places in Illinois and other States. An old German proverb says, "One should not believe any enemy though he tells the truth." The Independent officers and stockholders have for years been making the claim that there would be two great telephone companies the same as there are two telegraph companies.

We have found in Ohio that it is comparatively easy, where necessary, to readjust rates. The public can be depended upon to do the fair thing if it is given value received and is told what is fair.

Each delegate to this convention is intrusted with the responsibility of his respective State as to the outcome of the organization in the future. It will be but a short time before we will be able to talk over our system from Texas and other Western States to Philadelphia, Baltimore, New York, and New England points.

Are we going to be prepared for it? The committee appointed must consider all of these problems and each delegate should give due consideration in acting upon the reports presented. We represent over five hundred thousand stockholders to-day, who with their families and friends together with our employes compose an army that no power on earth can defeat if it has proper organization. At the signing of the Declaration of Independence Franklin said, "We must all hang together or we will hang separately." Are we prepared to form a similar association?

Standard Toll Signs*

By W. F. Laubach, *Akron, O.*

SOMEONE in defining what is meant by general publicity, says it is "keeping the name constantly before the people." That is exactly what Independent telephone operators must do. The name which we want to keep before the people has already been decided upon and accepted by us. The name is "Independent." This name can be silently and forcibly expressed by some design, so that not only the term "Independent," but its complement also, the word "Telephone," will be associated therewith, instinctively, when a certain design flashes on the vision. "Independent" telephone is what we want to get before the people, and keep before them.

To illustrate my meaning, who does not instinctively think of a breakfast food known as "Quaker Oats" when his eyes behold the characteristically dressed figure representing the Quaker? Or who thinks of ice water, when seeing the monogram "A. B." entwined about an eagle? Who does not instinctively associate with a picture of the rock of Gibraltar, this familiar sentence, "The Prudential has the strength of Gibraltar?"

These are instances of trade-marks or successful advertisements. Here, then, is the principle which should actuate us in the selection of a universal "Independent" telephone trade-mark, for such a trade-mark will be to a large extent an educator; for we still have the problem of impressing the public with the fact that the Keystone Company, of Philadelphia; the P. & A. Company, of Pittsburg; the Cuyahoga Company, of Cleveland, as well as the Farmers' Mutual Company, of Smith's Corners, are but a part of a great system extending from ocean to ocean.

How shall this education be best conducted? The answer is simple enough. Advertise! The question then arises, What is the most effective mode of advertising? It is generally conceded that that which appeals to the sense of sight, by which an impression is conveyed to the mind, leaves the most abiding impress. If this be true, and experience teaches that it is, we cannot go wrong by adopting some emblem that will appeal to the eye. Among this class there is none more effective than the shiel. It is peculiarly so, when made with the tri-colors of our National design. The standard sign, which I trust this convention may see fit to adopt, by a unanimous resolution, is the one with the shield in the National colors, red, white and blue, within a white circle surrounded by a solid blue field. If this convention should see fit to recommend the universal adoption and generous display by each "Independent" operating company throughout the United States, of a uniform trade-mark such as this sign would be, it will have accomplished a vast work. It will do much to eliminate that ignorance on the part of the public which exists and works against our interests. I refer to the belief, on the part of the general public, that the average local company is merely local, and for that reason cannot furnish long-distance service. Do I hear some interested investor or manager say, "We are jealous of our individuality, and do not care to adopt measures which may jeopardize our local standing?" To such let me recall the ancient motto, "United we stand, divided we fall."

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*Abstract of paper read before the First Annual Convention of the National Interstate Telephone Association, Chicago, June 20, 1905.

The Value of Telephone Securities.*

By A. B. Greenshields, *Philadelphia.*

I DO not propose to go into the progress and development of the Independent telephone business, as that will be more than fully discussed amongst you at this time. What I wish to do is to take a calm, conservative and common sense view of Independent telephone bonds as an investment security. During my banking experience of over twenty-six years, I have taken great interest in the different grades of securities which have been offered to the public, and the stability of these different securities during times of severe business depression and financial disturbances; and in my own mind have graded the best class of investment securities in somewhat of the following manner:

First. The interest bearing indebtedness of the national government, which is secured, not only by the entire wealth of the country, but also by direct taxation of the whole people.

Second. The interest bearing indebtedness of the different States and municipalities, which is secured by direct taxation of the people in these States and municipalities.

Third. The first mortgage securities issued by public service corporations, which usually take the form of a lien covering all of the property owned or acquired by the corporation.

Taking up the first, or government indebtedness, the amount is so small that it is nearly, if not all, absorbed by the national banks of the country to be used as a basis of currency circulation, which is profitable to them, although the actual interest return on the bonds is probably less than 2 per cent.

Taking the next, or State and municipal bonds, the demand for these bonds so far exceeds the supply that the yearly interest return to the investor is, say, from 2½ to 3½ per cent.; and the average American, unless he is a multi-millionaire, usually looks around him for a larger interest return for his surplus funds, which leads him into the third grade, or the interest bearing indebtedness of public service corporations.

GEO. R. FULLER.

Mr. Fuller is manager of the Rochester, N. Y., Home Telephone Company. He has always been one of the most active Independent telephone men in the country and was a member of the "Standard Forms of Accounting" Committee at the National-Interstate Convention.

The principal public service corporations may be divided into four classes, supplying the following utilities: water, light, communication, and transportation. In looking over these four classes of public utilities and analyzing the operations of the companies supplying them, we find a great difference, not only in the stability of their income and the mechanical wear and tear or depreciation of their property, but also in the possibility of accidents in operating, incurring damage and consequent loss to the companies. In water and telephone companies we find the annual rental system which, for stability of income, could not be improved upon. The mechanical wear and the possibility of accidents in operation are not of sufficient importance to be considered, while the yearly depreciation, in comparison with the original cost, is very small. In electric light, power and railway companies we find a fluctuating and uncertain income together with a very heavy mechanical wear and depreciation, which I fear has not been given sufficient consideration by many companies that are to-day dividing their surplus earnings amongst their stockholders. The possibility of damage and consequent loss to these companies through accidents in operating is an important item that should be fully considered. In steam railroad companies the income depends entirely upon the conditions prevailing during the different periods, increasing enormously in good times, and, in many cases, causing extravagant expenditures; decreasing proportionately in periods of depression, without the companies being able to correspondingly decrease expenses below a certain point. With heavy demands upon their transportation facilities, the mechanical wear and tear is very great, and at such times the depreciation of their property is very heavy. Then, again, when their equipment is idle, the percentage of depreciation to earnings is even heavier, as accidents in operating frequently incur heavy damages, the consequent loss to the companies cannot be estimated in advance.

I am frequently asked the question, What tangible assets has a telephone company to show for its capital obligations? Like any other public service corporation, it is fully equipped to continually supply a practically perpetual and ever increasing demand for a necessary public utility; and while the real assets of the company are not so much in evidence as in the case of a manufacturing or an industrial company, they are, nevertheless, of much greater value, being guaranteed a continual and never ceasing usefulness if properly maintained. Such questions, coming from men of mature deliberation, are sometimes very amusing. A few days ago a gentleman who is heavily interested in a prominent steam railroad company's securities laughingly remarked that a telephone company had practically no tangible assets to show for its bonded indebtedness; and when I called to his attention the fact that the same railroad, in building a new low grade division, was spending in some cases $240,000 per mile, and asked him what the assets of a forty-foot cut in grading the road would be worth to the holder of that company's securities, he began to think, and is thinking yet.

The real value of the assets of any public service corporation is the company's ability to supply the people continually with a public convenience or service which is always in demand; not what can be secured for these assets as so much merchandise. In my opinion the safest and most stable of these public service corporations to invest in are the companies supplying such utilities as water and telephone service. Their earnings are on a fixed annual income basis, and, unlike other public service companies, their earnings are not subject to changing conditions prevailing at different periods. Both of these utilities are absolutely necessary to our business and social life, and for neither of them can we find a substitute.

Securities issued by steam railroad companies are to-day much in favor with the investing public, and at present the interest return is in many cases as low as 3¼ per cent. per annum; yet there are few of these companies that have not been in the hands of receivers at some period during their lifetime. Like the telephone companies, they are public service corporations, depending upon the people for the revenue necessary to pay not only the operating and maintenance charges, but also the interest on the money spent in their construction.

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*Abstract of address delivered before the First Annual Convention of the National-Interstate Telephone Association, Chicago, June 20, 1905.

On the other hand, the new telephone company commences business under entirely different circumstances. Starting in cities and towns where an actual demand for its service is anxiously awaiting the completion of its property, revenue sufficient to pay its operating and maintenance and to leave a handsome interest return on the cost of its construction, is not only assured, but the service rendered its subscribers is also actually paid for quarterly in advance. As cities, towns, and boroughs are continually growing, the demand for local and long distance telephone communication must grow proportionately; consequently, so long as a telephone company can supply the people with a prompt and efficient service, the people who invested in that company need have no fear for the safety of their capital or the annual interest return on their investment.

Until recently country bankers kept their eyes riveted on Wall street, thinking that all securities worth investing in emanated from that source. The result of their united buying, together with that of their depositors acting upon their advice, has given undue popularity to an inferior class of securities called "collateral trust bonds," some of which are now selling on a basis of less than 4 per cent. Prominent New York bankers have gone out of their way to advise their country correspondents to purchase them, pointing out the fact that insurance companies had bought millions of them for permanent investment. The recent investigation of the Equitable Life Company's affairs has made plain to all of us the reason for instilling confidence in the minds of purchasers of such securities. I think that, from now on, the investors throughout the country will give more attention to the first mortgage bonds of companies in their own localities, and to them I recommend those of conservative and well-managed Independent telephone companies, which at present prices return from 5 to 6 per cent. upon the investment. The profit from an Independent telephone plant is as large as from a steam railway without the corresponding risk and delay.

Combined Telephony and Telegraphy*

By Samuel G. McMeen.

PERHAPS the advantages of combined telephone and telegraph working on the same circuits can be shown more clearly in a picture than otherwise. Fig. 1 is intended to show what is at present possible in this direction. In this figure it will be seen that over a line of a single wire, using earth as a return, one telegraph and one telephone circuit may exist at the same time. Over a two-wire line, by one method of operation, one telegraph and one telephone circuit may be secured at the same time; and this may be accomplished in two different ways so far as the apparatus and principles are concerned.

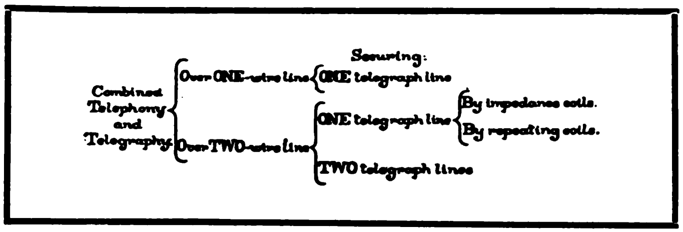

Fig. 1.

By another method of working, a two-wire line may be made to furnish one telephone and two telegraph circuits at the same time. In all of these arrangements, under proper conditions, there is no interference between the two classes of service. The whole matter of superadding telegraph to telephone service on a one-wire line, or the reverse, may be dismissed by saying that it is not yet shown to be possible to do both things over a single wire without reducing in some degree the quality of the telephone service; the principal commercial application of such a plan is to convert the existing grounded telegraph lines into combined ones, thus securing telephone service of some value, without serious interference with the simplicity and convenience of the telegraph service. This is accomplished by the introduction of certain rather delicate apparatus for signaling, of more than usually powerful transmitters, and of receivers of less than usual sensitiveness. A little thought will show that circuits specialized in this way cannot be connected to the standard telephone systems of cities, so that this form of combined working must be considered special, though valuable.

Combined working over two-wire or metallic circuit telephone lines, however, is free from this objection, and, indeed, from any other very serious ones. I shall try to show what and how important are the limitations which may be expected.

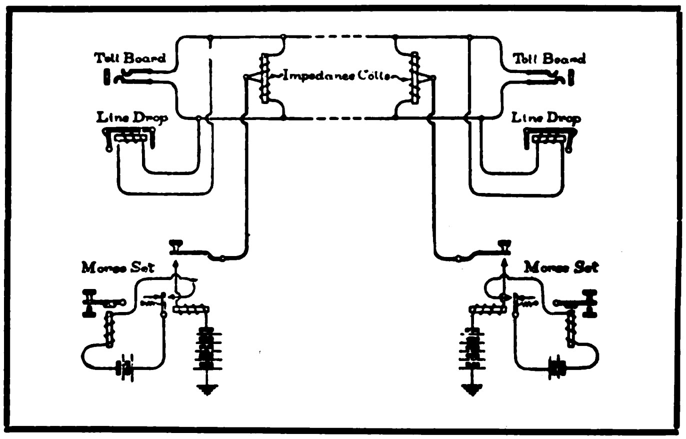

Fig. 2.

Any metallic circuit telephone line which is good enough for quiet commercial telephone service may be made to furnish one telegraph circuit by having impedance coils bridged across it, as shown in Fig. 2. These coils should contain turns enough to enable them to be bridged across the circuit with no greater reduction in telephone transmission than would be caused by bridging across a high impedance standard drop or ringer. The magnetic circuit may be open or closed; that is, the windings may be upon a straight bundle of iron wires or upon a ring-shaped core. A tap is to be taken from the middle of the winding or, which is equivalent, from the junction of two similar windings on the same core. This tap is carried to the telegraph apparatus and may be considered simply to be the end of the telegraph line. Any desired arrangement of telegraph apparatus may be added to the circuit thus secured, the only limitation being, that the method of working should not involve high frequencies, such as are met in the Edison phonoplex or in any of the high speed systems of automatic telegraphy.

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*Paper read before the First Annual Convention of the National-Interstate Telephone Association, Chicago, June 20, 1905.

Should it be desired to build up a telegraph circuit longer than the available metallic circuit, or to carry the telegraph circuit over a route not already provided with a telephone circuit, the tap for the purpose may be taken from the telephone pair through an impedance coil and into another pair in a similar way. This arrangement is shown in Fig. 3.

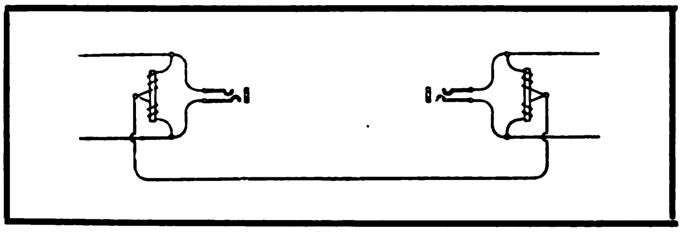


Fig. 3.

If desired, a telegraph set may be inserted at such a point as this, where the telegraph line transfers from one pair to another. Fig. 4 shows this condition.

Should it be desired to insert a pay station in a telegraph circuit at a point which is not a terminus of a telephone circuit, condensers may be inserted in each of the wires, impedance coils bridged beside them, and the Morse apparatus inserted in the bridge wire which thus emerges from the pair. This arrangement is shown in Fig. 5.

In all the foregoing plans involving the use of impedance coils, there exists the difficulty that in case the two telephone lines so equipped are switched together through a toll board having no condensers or repeating coils in its cord circuits, the two sets of Morse apparatus will be connected together and confusion may result, as much as when two telegraph lines become crossed. Inasmuch as condensers of two m. f. or greater capacity do not interfere with successful telephone transmission, cord circuits so equipped will be free from this fault. For the same reason the loop arrangement shown in Fig. 5 is free from any telephonic objection.

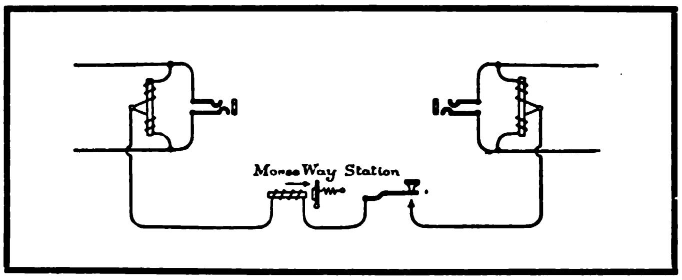


Fig. 4.

There is another fault in the impedance coil plan, in that ringing generators, suitable for local exchange line signaling, often require to have one terminal permanently grounded, or to have temporary grounds appplied during the time signals are being rung upon party lines, grounded rural lines, or other circuits involving ground in any way. If the same source of ringing current is used for toll line signaling, a little thought will show that the telegraph outfit will frequently be disturbed by a series of dots, caused by ringing current passing to ground through the Morse relays.

A preventive for such a derangement is found in providing separate ringing apparatus for toll operators, or by securing the ringing current for these operators through special transformers.

Roughly speaking, the best conditions of operation with the impedance coil plan will be secured when, with a high resistance total Morse circuit, high resistance telegraph relays are used. It is not required that the resistance of the impedance coils be great, but only that their inductance and consequent choking due to voice currents be great. This is an immediate result of the iron core and the turns. For an expedient, a ringer may be used as such a choke coil, its two terminals being bridged across the telephone line, and a telegraph tap taken by extending the junction between the wires of the two spools. Such an arrangement, if the spools are at all nearly equal, will be quite successful. If a number of circuits are so treated, the ringers of the different circuits must not be stored close together with their cores parallel, or cross-talk between the circuits may result. This may be prevented by placing the adjacent ringers with their cores at right angles to each other.

It is obvious that a high impedance tubular drop having a middle terminal may also be used for such a telegraph tap, and in such a case the danger of cross-talk disappears, being prevented by the shield.

If such high impedance devices as ringers and drops are used for these taps, the Morse relays should be wound to high resistance, say 500 to 1,000 ohms.

By the use of repeating coils to be permanently inserted in the telephone line at the points where the telegraph tap is to be taken from the circuit, one Morse line may be secured from a two-wire circuit quite as has been described for the use of impedance coils. Fig 6 illustrates how the tap is taken from the line side of the repeating coil. Coils may be secured in the market with arrangements made for taking out this tap. Connections to Morse apparatus are quite the same as are shown in Figs. 2 and 4. This arrangement has the advantage that no connections between telephone lines in the way of ordinary switching, nor any peculiarities of ringing apparatus, will affect the telegraph apparatus adversely. It has the disadvantage that the introduction of two repeating coils in a circuit causes a distinct loss in both voice and signal transmission, all the more marked when several lines so equipped are connected together. From the practical standpoint, this plan is not recommended for other than short lines, and then only under excellent conditions where freedom from interference is the thing most greatly to be desired.

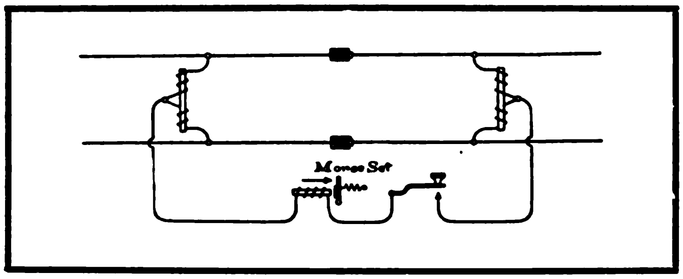


Fig. 5.

The reason for non-interference between the telegraph and telephone services in either the impedance coil or repeating coil plans is, that at any point where telephone apparatus connects to the two wires of the circuit, the potential difference of the two wires due to telegraph currents is always zero.

The arrangement of things shown in Fig. 7 is that which gives two telegraph circuits in addition to one telephone circuit from each pair of wires. The drawing shows the situation far more clearly than it can be described in words. The principle involved is that of different frequencies, the pulsations which make up the telegraph signals being so very much slower than those of the voice currents. When it is remembered that this drawing shows the equipment at one end of the line, and that the distant equipment is an exact duplicate; that the impedance coils *a a* are capable of passing telegraph impulses with little or no harmful effect upon them; that these coils further act with such a choking effect upon voice currents as to be practically opaque to them, and that the condensers of 2 m. f. each are relatively transparent to alternating currents and opaque to direct currents, it will be easy to see how the two systems of communication can go on at the same time.

A close examination of the drawing will show that the direction of windings in the coils *a a* is such, that the two halves of the total winding are connected in the familiar differential or reverse relation to each other. It will also be noticed that this is not true of the coils *b b*. In the coils *a a*, therefore, so far as direct currents are concerned, the magnetizing effort of one winding of each complete unit neutralizes that of the other; and this is also true for direct currents, even if interrupted at the highest frequency used in telegraphic hand work; but for currents of such high frequency and small volume as those of speech, the windings of each unit are practically two independent choke coils in series.

While the other arrangements which have been discussed secure non-interference between the two systems of communication by preventing the telegraph from producing any effect at all in the telephone receivers, this plan operates to modify the telegraph signals in such a way that, although they affect the receivers, they do not produce audible sound. A careful examination of the diaphragm of a receiver properly connected across a composite line while the telegraph is working will show that it is moving through a considerable range, even though nothing whatever can be heard when the instrument is held to the ear.

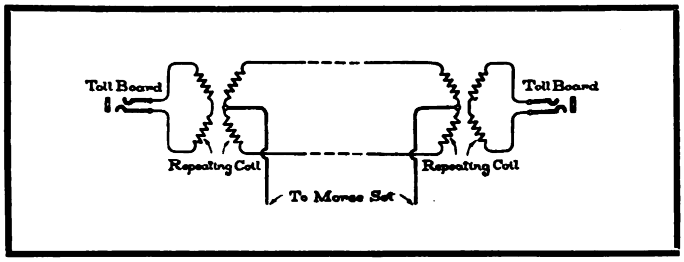


Fig. 6.

I have indicated that each of the plans has some disadvantages. The flaw in this plan is that the shunt across the circuit through the coils and condensers is sufficient to prevent any ordinary ringing. Signals from one station to another require to be given over some Morse line, or by the assistance of special apparatus adapted to respond to currents of very high frequency. As the voice current is of a high frequency and can pass over the pair, so some other high frequency, but of larger volume, may be used to operate a relay at the distant station, and that in turn to display a signal.

The ordinary ringing current is of about sixteen cycles per second; a skilled telegraph operator will send thirty-two dots per second; the half waves of the ringing current are less abrupt in change than the telegraph dot. For these reasons it is apparent that one may send ringing current instead of telegraph current over any composite Morse line without interfering with the telephone. This possibility enables one to sell the service of one side and retain the other for ringing. Telegraph circuits secured in any of these ways may be treated as desired within reason, in the way of extending by repeaters. There are three reasons why it is commercially of advantage to apply these composite methods to some of the circuits operated by almost any long-distance organization.

One of them is to secure an additional earning from the property, because by the very nature of things the lines are practically out of use during a large part of each total day. It is not found difficult to secure an annual telegraph revenue equal to five per cent. on the total cost of the circuit, and this without establishing offices or maintaining a special organization to care for commercial messages.

There is more demand for telegraph service in its private line form than is being fulfilled by all the existing telegraph equipment. An active canvass of commercial interests in one's locality, is certain to produce contracts, at a rate less than for other methods, which will supply the consumer with a better result than he is now securing.

The investment on the part of the telephone company per telegraph station varies with the different plans, but in all cases is only about as great as the cost of the line and equipment of a telephone subscriber, located a similar distance from the central office. This statement is meant to cover the complete equipment, including the telegraph apparatus required at the consumer's station.

The second reason is the advantage of ticket wires over which much or all communication between toll operators may take place. Naturally, this enables toll operators to prepare for one conversation over an important circuit, while another is going on. An intelligent use of such facilities will enable the carrying capacity of the more remunerative lines to be increased enough to defer the stringing of additional circuits.

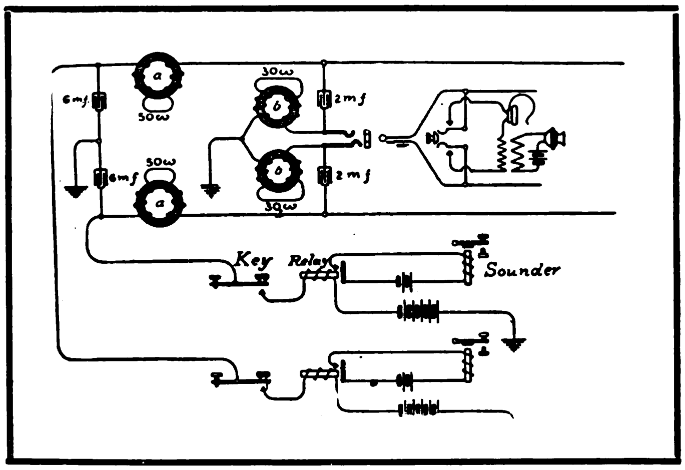
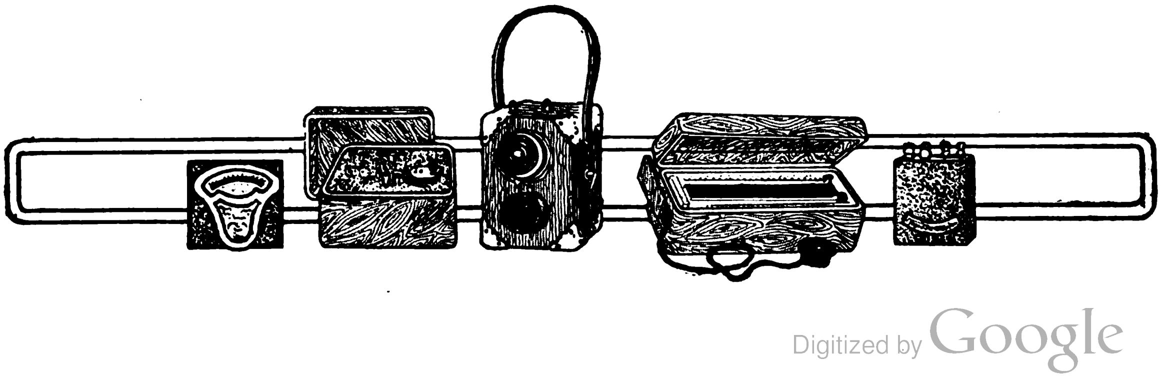


Fig. 7.

The third reason is in the transaction of the official business of the telephone company. By its very nature such a company has its offices scattered about the country, and it is too often its tendency to overburden its own circuits with its official business during the day, while on certain routes there may be too few circuits to carry even the remunerative business of the public. It is inconvenient to force the official business into the less busy hours of the day. A very small investment in composite circuits, and a slight rearrangement of the company's organization will enable an official to dictate telegrams which the stenographer herself, with a little knowledge of Morse, may place immediately upon the line. Such business may or may not be confirmed by mail. It is not essential that the operators be skilled to high speed, as training in accuracy only is sufficient, even fifteen words per minute is fast enough. Very fast operators reach sixty.

If it is not desired to extend the telegraph network over an entire system, official telegrams may be landed in important centers and transmitted by telephone to destination. Experience in this method of handling messages will show that errors are less frequent than might be expected.



Twisted Pair Distribution

By P. A. Price.

A PROBLEM which confronts telephone managements is a method of reaching subscribers from aerial distributing terminals. Bare wires will get crossed. They attract static discharges and in case they break and fall across foreign circuits of dangerous potential, serious consequences may ensue. These objections have led to the use of a two-conductor twist, commonly called "twisted pair" or "Marsh."

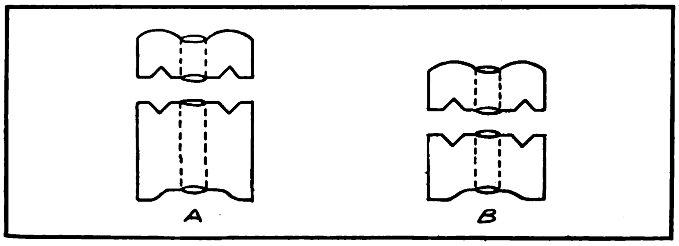


Fig. 1. Split Knob for Twisted Pairs.

No. 14 B. & S. copper is a favored gauge for the conductors and the insulation is usually one or two layers of rubber and a heavy, saturated weather-proof braid. This braid is frequently indexed—i. e., one conductor carrying a knotted thread in the outer braid or the inner rubber insulation being of different colors. This will be found useful when selective party lines are in operation. For holding the strain from distributing point to point of subscriber attachment a band, similar to Fig. 2, is frequently used. This is of galvanized iron and the "hump" is provided to retain the porcelain "brunt," or circuit breaker (Fig. 3), the groove of which is encircled by the "hump" or ring of the band. The band is provided with four holes, whereby it is attached to the building by iron, wood-screws, flat-head bight, No. 16, one and a quarter inches long. The number of retaining screws used will depend on the length and consequent weight of the span. The twisted pair is pulled through the knob and drawn up to the determined allowance of slack and then slacked off while the conductors are given a double wrapping of insulating tape, so placed as to cover the wire where the knob bears. The dead end is made without cutting the wire and the free end drawn through the loop of the dead end and brought to a knob, similar to Fig. 1A. These knobs are in two parts and are provided with four grooves, only two of which are shown. This first knob is placed within a foot of the brunt and band and is intended to hold the wire in case the band gives way. The two conductors of the twist are spread at the knob, each given two short wrappings of tape and are placed in separate grooves. Three and a quarter inch, No. 16 flat-head bright wood screws are used to fasten the knob to the wall. In case this attachment is made on a shingled wall or clap-boards, where the screw is not long enough to reach firm wood, a shorter knob is used, as shown in Fig. 1B.

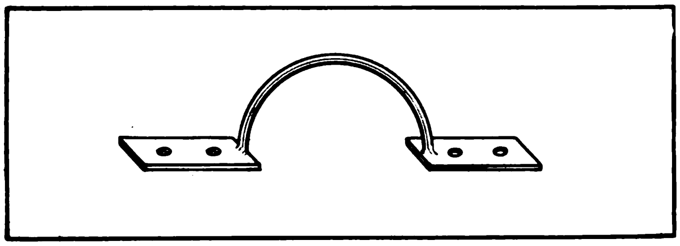


Fig. 2. Attachment Band.

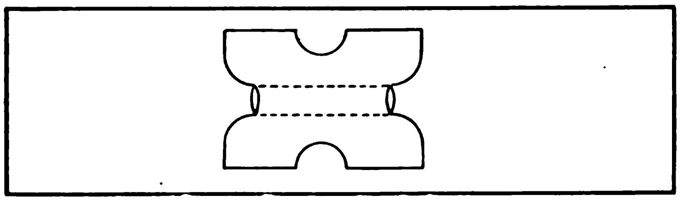


Fig. 3. Porcelain Circuit Breaker.

The twist is then carried by these knobs (each conductor being separated and taped in grooves) to the point of entrance, where it is provided with a drip and taken into the house through tubing of insulating material. The taping is merely to protect the insulation of the conductors at the point of strain. When the twisted pair is taken across drain pipes, plumbing or other metallic grounds it is enclosed in circular looms or other insulating protector.

When the band is attached to a brick or stone wall two methods are used. Holes may be drilled and plugged with wood and wood screws used or one-half inch holes are drilled to the depth of one inch to correspond with the two inner holes of the band. A 3-16" x 1½" galvanized star bolt is provided with a ¾" sleeve of lead pipe, ¼" inside diameter, and the bolt so equipped placed in the hole and the lead sleeve "mushroomed" by means of a small piece of iron pipe driven in over the bolt. The band is then placed on the bolts and the nust tightened with pliers or wrench Fig. 4A shows a device used for this work. The weight *w* is movable on the shaft, at the ends of which are attached a star drill *a* and the open tube *b* for "mushrooming" the lead sleeve *c* and c^1, shown together with the bolts s, s^1 in Fig. 4*B*.

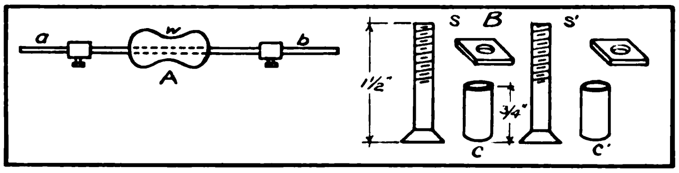


Fig. 4. Brick Drill and Plugs.

Fig. 5*A* gives an idea of the house work. It will be noticed that the band is placed on a slant in order that the screws will not all lie in the same grain of the wood. Fig. 5*B* shows method of attachment to iron ring-top on the distributing pole. No. 4 or 5 knobs are used, attached to the under side of the iron frame, by means of stove bolts. In this position moisture will drain off more rapidly, and snow has less chance to gather. Each conductor is dead-ended on an individual knob, and connected to the jumper-wire by a sleeve.

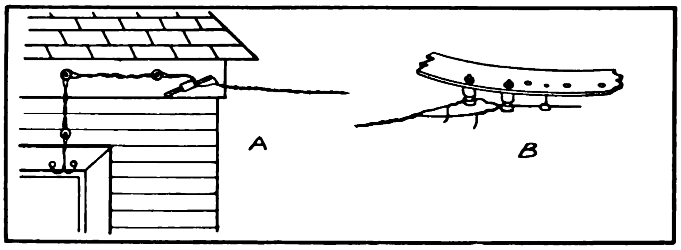


Fig. 5. Methods of Attachment to Building.

All splices in twisted-pair work should be made with sleeve connection, or if hand connections are used, they should be thoroughly soldered. No acid should be used in soldering. Joints should be "staggered" at least ten inches, and each joint wrapped, first with rubber and then the usual cloth tape, to preserve uniformity of insulation. Avoid all kinks in serving out the wire. When obliged to carry twisted-pair through trees, hang it in knobs, as shown in Fig. 3, serving the conductors with tape at the place, and tying-in to the knob with light marlin. All sharp corners should be dead-ended each way on separate knobs, and the connections made with sleeves. When attached to limbs frequent dead-ends will present much trouble caused by the swaying of the branches. The hangers may be fastened to the limbs by marlin rope.

The Editor's Page.

SOME RIPE BAIT FOR THE FARMER.

THE Bell press bureau is surpassing itself these days in the ingenuity of its methods. We have called attention from time to time to the manner in which this institution misuses those country newspapers that are willing to sell their columns, and it seemed to us that about every ruse in the calendar had been exhausted to put matter before the country readers in such a way, that they would be misled into believing the Belle a beneficent institution. Now, however, we come across a piece of work that leaves previous records in the shade. The matter was started at considerable expense in that great friend of the farmer, the New York *Tribune*. It is one of the strange features of metropolitan journalism that the only paper among the great New York dailies that prostitutes itself for hire is the paper founded by Horace Greeley, and now owned and controlled by the Hon. Whitelaw Reid, our ambassador to England. For a consideration of $2.50 and upward per line, the *Tribune* permits any person or institution that has an axe to grind to buy its reading columns.

The Bell Telephone Company, taking advantage of this condition, caused a long article to be printed in the *Tribune* under the caption "Bell Telephone Company Forced to Surrender. Farmers of Iowa Win Their Twenty-Year Fight Against Monopoly." Then follows what at first glance seems to be an attack on the Bell company, showing that it has been routed in the State of Iowa, and that it has "at last surrendered to the farmers." A careful reading of the article, however, makes clear its object. That object is to deceive the farmers in Iowa and other States into the belief that, at last, the time has come when they may, with safety to themselves and their institutions, connect up with the Bell company. A typical paragraph of this article, which occupies over a column in space, reads as follows:

> This means that in the end all lines and exchanges must be connected; the two systems will be, for every purpose of physical operation, merged into one. It will mean in the end *that two systems* cannot be maintained side by side. * * * *

To the Independent telephone man the matter is clear enough. Its true character sticks out in every line. But, of course, this matter is not intended for consumption by telephone managers, but by the farmers and dwellers in rural communities, who know nothing about the telephone situation as it really is. Naturally, here the effect will be to lull subscribers into a sense of security that will make them listen to the propositions of the Bell agents when they come around with contracts to connect Independent rural lines with Bell exchanges. The real nigger in the wood pile is revealed by the concluding paragraph of this dishonest article in the *Tribune*, which reads:

> In Iowa, it is true, the (Bell) Company has been defeated; but that has been accomplished only by peculiar local conditions. The farmers of Iowa won the victory with their rural lines. The Bell people still have their powerful position, their immensely valuable business in other States. They are still strong in legislatures and with Congress; they are still able to buy every promising improvement, every device protected by patent that is offered to them.

We commend this article to the careful reading of all of our subscribers, in order that they may meet this plausible piece of press work when it appears in their vicinity, as it will. The entire matter is carried under a Sioux City, Iowa, date line, and comes in the guise of an alleged "telegraphic special."

THE BELL'S LITTLE JOKE EXPLODED.

In order that the investment in the *Tribune* might be harvested to the best advantage, the Bell Press Bureau followed this publication up with plate and syndicate matter, and peddled it out to all of the country newspapers that would print it for price. This matter was made up of extracts from the original article, and was used extensively in every territory where the Bell is striving to strengthen its position among the farmers and dwellers of the rural communities. Just at present the country papers in the New England States, as well as the country papers in Illinois, Iowa and the Northwest, are deriving a good thing from this work. The matter that is sent to these papers takes the form of a brief "summary." The only trouble is that, as usual, the press bureau falls down, in that it does not differentiate at all in the preparation of these summaries. They are precisely alike to the last period and comma, and take the following form:

> It appears that the farmers of Iowa have won a great victory over the Bell telephone companies. For years they have maintained independent companies all over the State, while the Bell lines have also been extended into every district; in many instances instruments belonging to opposition organizations being installed side by side in a residence or place of business. It is now said that the independent companies have obtained the advantage by cultivating the rural field, so that the Bell companies have at last had to confess themselves beaten. The result will be that the latter will now permit connections to be made between their instruments and those of the other companies, and it will no longer be necessary for anybody to rent two telephones from antagonistic establishments.

Could anything be much "smarter" than that? "It will no longer be necessary for anybody to rent two telephones from antagonistic establishments." Come right into our parlor, Mr. Farmer; we're harmless now. Where is the "green goods" circular that could touch this previous document for clean-cut, downright knavery?

THE WEEK OF THE NATIONAL-INTERSTATE CONVENTION.

THE National-Interstate convention, which was held this week at Chicago, means more to the Independent telephone industry than most people probably imagine. It means that at last the Bell Telephone Company is to be brought face to face with systematic opposition. It means that the efforts made heretofore, which have been scattered and disconnected, will now be regular and continuous. We should be very much surprised if, as a result of the organization effected, the Independent industry does not grow very much faster during the coming year than it did during the past two years, and this means a growth unprecedented in the industrial world. We Americans have so long been accustomed to seeing our enterprises move forward at a rate that would fill foreigners with amazement that very few, even among those immediately concerned, have appreciated the tremendous growth of the telephone industry.

In passing, we cannot refrain from expressing, on behalf of the operators, and the manufacturers also, the great obligation that the industry is under to the men who led in this organization movement and who succeeded in perfecting a real National association built on real representative lines.

IN THE OPERATING FIELD.

CORN BELT TELEPHONE COMPANY OF WATERLOO TO IMPROVE ITS SYSTEM.

THE Corn Belt Telephone Company, which is the name proposed for the new Independent company that recently acquired by purchase the plant and system of the United States Telephone Company of Iowa, proposes to place the authorized capitalization at $300,000, and the preparation of the necessary articles of incorporation upon this basis is now under way. Just as soon as the reorganization is effected, it is announced, the work upon necessary and desirable improvements will be commenced. Plans are under way for the expenditure of a large sum of money in Waterloo and Cedar Falls, while the toll lines will be rebuilt and the service rendered more efficient.

FRANK L. BEAM REPORTS EXCELLENT INDEPENDENT DEVELOPMENT AMONG OHIO COMPANIES.

FRANK L. BEAM, former manager of the Citizens' Telephone Company, of Columbus, but now president and general organizer of the Ohio Association of Independent Telephone Companies, has returned from a trip over the State looking after the interests of the association. "I found things in good shape," said Mr. Beam. "The increase in the use of the telephone is something wonderful and there is hardly an exchange in the State which is not behind on contracts. The expansion of the telephone seems to have only begun."

CANADIAN GOVERNMENT REPRESENTATIVE TO INVESTIGATE ENGLISH MUNICIPAL SYSTEMS.

SIR WILLIAM MULOCK, postmaster-general of Canada, and the chairman of the telephone committee of the Dominion Parliament, will visit some of the cities and towns of Great Britain this month, where municipal telephone systems are in vogue. He will report the result of his investigations to his committee upon his return to Canada. He also proposes to consult with the authorities of the British Telegraph Department with a view to ascertaining how the trunk telephone system is being operated in Great Britain.

FARMERS IN VICINITY OF MARSHALL, MICH., DISSATISFIED WITH BELL.

THE farmers in the vicinity of Marshall, Mich., who are subscribers to the service of the Michigan Telephone Company, are much dissatisfied with what they term unfair discrimination by the Bell people. When the Citizens' Telephone Company was organized at Marshall four years ago, the Bell telephone was thrown out of nearly every residence in the city and the business places naturally followed suit, the Independent telephones being substituted. Last fall the Michigan Telephone Company made an effort to build up its Marshall exchange again, and to that end offered city subscribers free service to April 1. The privilege has later been extended to July 1. Meanwhile the farmers who are now using the Bell extensively have been charged the full $15 rate from the start and are very indignant.

MEETING OF MISSOURI INDEPENDENT TELEPHONE MEN AT SEDALIA.

ABOUT thirty members of the Missouri Independent Telephone Association met at Sedalia, Mo. recently, for the purpose of revising the constitution and by-laws of the association, thereby giving greater scope to the Independent companies. President Gary, of Macon, presided, and Frank S. Leach, of Sedalia, was secretary. One of the changes in the constitution will enable the Missouri association to become a member of the National Inter-State Association whenever it may be deemed advisable. The following officers were elected: Frank Buffum, of Louisiana, president; W. B. Scruggs, of Harrisonville, vice-president; Theo. Gary, of Macon; J. A. Hudson, of Columbia, and F. C. Taggart, of Richmond, executive committee.

NEW STATE TELEPHONE COMPANY OF IOWA TO BUILD EXTENSIVE TOLL LINE SYSTEM.

WORK has commenced on the construction of the first of the New State Telephone Company's copper toll lines into Sioux City, Ia., this being the line connecting Sioux City with Le Mars. At Le Mars the line will open up a field of several hundred towns in northwestern Iowa and several thousand telephones will be given connection with Sioux City through the new Independent system. This construction of new copper toll lines is under the supervison of P. Cockerill. The company is immediately to build lines to Moville to connect with lines to the east; to Canton, S. D., opening up South Dakota to Sioux City, and to several towns in other directions.

GOVERNMENT TO INSTALL TELEPHONES FOR USE OF LIFE SAVERS ALONG NEW JERSEY COAST.

STEPS are being taken to establish, in the Fifth Lifesaving district, a system of patrol telephones extending along the New Jersey Coast from Cape May to Sandy Hook. A metal box, fitted up with a set of telephones, will be placed at each half-way place where the patrols meet. This will enable the keeper of the station to communicate with the patrol and the patrols can call their attention in case of wreck or accident. Under the present arrangements, if a patrol saw a vessel in distress, he would have to run back to his station to report the matter, in doing which he would lose valuable time. William Bolton, superintendent of the Government telephone lines, and the district lineman, Richard Winemiller, are making preparations for putting in the new system. Work will be begun as soon as possible in order that the system may be in working order by the time the crews are put on duty August 1.

CONTRIBUTIONS SOLICITED

THE AMERICAN TELEPHONE JOURNAL is always in the market for crisp, snappy news or technical contributions. Descriptions of ways to do things telephonic, illustrated with sketches, and also descriptions accompanied by photographs are especially acceptable and will be paid for. Literary skill is not essential, but is, of course, appreciated. Send your sketch, photographs, and write the matter as well as you can. It will be dressed up, if necessary. Here is an opportunity for telephone men from engineers down to ground men to increase their incomes. An article cannot be too technical nor too elementary for us to consider. Articles illustrated with photographs are particularly desirable and will be substantially acknowledged.

IN THE OPERATING FIELD—*(Continued)*

ASSOCIATION OF NATIONAL TELEPHONE COMPANY'S EMPLOYES FORMED IN ENGLAND.

AN Association of Employes of the National Telephone Company has been formed in England to protect their interests under the transfer to the Government. Some 13,000 have, it is said, joined. The chief question at present is the demand for an equitable pension scheme for all the employes who will be taken over by the government.

CHARTER APPLIED FOR IN NEW HAVEN, CONN., BY THE CITIZENS' TELEPHONE COMPANY.

APPLICATION has been made for a charter in New Haven, Conn., by the Citizens' Telephone Company. The men who have signed the application are Charles M. Jarvis, of Berlin; I. DeVer Warner, of Bridgeport; E. P. Bullard, of Bridgeport; George C. Edwards, of Bridgeport; N. W. Kendall, of New Haven; D. A. Blakeslee, of New Haven; J. Van Vechter Olcott, of New York; J. Aspinwall Hodge, of New York, and D. A. Reynolds, of New York. In an interview George C. Edwards stated that the company will have a preliminary capitalization of $1,000,000 with the privilege of raising it to $10,000,000. Rates charged will be about $15 a year. The charter applied for calls for the operation of the system within two years after it is granted.

ROBERT HALL GIVES PICNIC TO PITTSBURG AND ALLEGHENY EMPLOYES.

EMPLOYES of the Pittsburg and Allegheny Telephone Company were recently the participants in a picnic held at the farm of Robert C. Hall, the Pittsburg financier, who is treasurer of the company. Mr. Hall's farm is located near Ross Station, on the West Penn division of the Pennsylvania Railroad, a few miles out of Pittsburg. A special train carried 400 employes, leaving the Union station at 1:30 P. M. The officers had been divided into committees, one having charge of sports, one of music, one of the supper and one of dancing. In every way a most enjoyable afternoon was spent, and one which will be long remembered by those who were fortunate enough to be present.

BINGHAMTON DISTRICT OF NEW YORK STATE ASSOCIATION HOLDS MEEETING.

AN enthusiastic and well-attended meeting of the Binghamton district of the New York State Independent Telephone Association was held recently. New members elected to the association were: E. H. Alderman, of the Castle Creek Telephone Company, Castle Creek; A. H. Andrews, of the Lester Telephone Company, Great Bend, Pa., and Will A. Johnson and E. L. Green, of the Mt. Ettrick Telephone Company, both of West Chenango. The next meeting will be subject to the call of the president, J. B. Marquis, of Norwich.

NEW INDEPENDENT TELEPHONE COMPANY FORMED AT MALONE, N. Y.

THE Adirondack Home Telephone Company has been incorporated with headquarters at Malone, N. Y. The following lines will be operated: From Malone to the villages of Chateaugay, Franklin Falls, Saranac Lake, Tupper Lake, Santa Clara, Fort Covington and thence to Malone; from Malone to Massena postoffice, Waddington, Ogdensburg, Morristown, South Hammond, Gouverneur, Benson Mines, Childwood, Parishville, Canton; from Malone to Redwood, Clayton, Cape Vincent, Mannsville, Watertown, Carthage, Antwerp; from Malone to the villages of Diana, Pickney, Osceola, Port Leyden, Lowville and Jordan Falls; from Malone to Loon Lake, Dannemore, Plattsburg, Peru, Rouses Point and Union Falls; from Malone to Chateugay, Burke, Lawrence, South Bangor, West Bangor, Brushton, Moira and Whippleville; from Malone to Minerva, Ticonderoga, Port Henry, Minerville, Elizabethtown, Essex, Keeseville, Ausable Forks, Upper Jay and Newcomb. The operations of the company are to be confined to the counties of Franklin, Clintoo, St. Lawrence, Jefferson, Lewis and Essex, practically taking in all of Northern New York. In this territory are a number of very thrifty towns which will be greatly benefitted by the new Independent telephone service.

CONSOLIDATED TELEPHONE COMPANY OF PENNSYLVANIA EXTENDING ITS TERRITORY.

THE Consolidated Telephone companies of Pennsylvania, now controlling the Independent plants at Wilkes-Barre, Scranton, Carbondale, Pittstown, Allentown, Reading, Slatington, Lehighton, Mauch Chunk, Hazleton, Shamokin and other towns, with long distance connections as far as Buffalo and Philadelphia, is installing many new telephones and enlarging its long distance service in every direction. To meet the growing demand for increased long distance facilities, the directors of the company have recently authorized a further issue of $600,000 5 per cent. gold bonds, which are now being placed on the market. The money raised on this bond issue will be used exclusively for the erection of new lines and the installation of branch plants.

PRINCETON, IND., INDEPENDENT TELEPHONE COMPANY INSTALLS NEW SWITCHBOARD.

A NEW switchboard for the Independent Telephone Company of Princeton, Ind., is being installed in the new quarters of the company. The new board has a present capacity of 600 single-line telephones, while the old board only accommodated 480. The new board has an ultimate capacity of 2,000 lines. In addition to the switchboard the company is installing new batteries and generators. None of the present plant will be used. It is estimated that it will require at least three weeks to complete the installation. The company hopes to be located in its new home not later than the first of July. The present business of the company is growing rapidly, and many contracts are being held up for lack of present facilities.

FOREMAN A FELLOW SERVANT.

A SUIT was brought against the American Telephone & Telegraph Company, in Barnwell county, South Carolina, for damages due to personal injuries. The plaintiff was one of a gang of men employed to clear the defendant's right of way. The foreman of the gang was joined as a defendant with the company. The complaint alleged that the foreman ordered the plaintiff to pull down a certain pine tree which had been cut and lodged against another tree, using block and tackle to accomplish the work; that the plaintiff proposed to the foreman to remove the tree by first taking away the one that it was lodged against, but that the foreman would not permit the plaintiff to perform the task in that way. The trial court held that the foreman was a fellow servant with the plaintiff and sustained a demurrer to the complaint based upon that ground. This action was sustained by the Supreme Court. The Court said: "In determining who are fellow servants the test or rule in this State is not whether the servants are of different grade, rank or authority, one of them having power to control and direct the services of another, but the test is in the character of the act being performed by the offending servant, whether it was the performance of some duty the master owed to the injured servant, the performance of which duty the master had entrusted to the offending servant. The general duty of a master is to exercise due care in the selection of servants, to furnish appliances reasonably adequate and safe for the performance of the work and to provide a reasonably safe place in which to work."

FOR SALE

Advertisements under this head, $1.00 for 25 words or less for each insertion. Prepaid.

FOR SALE.—Wheatstone Bridge $25.00. Also a Queen Voltmeter, 160 volts scale (new), $20.00. Bargain. Address Box 399, care The American Telephone Journal, 116 Nassau Street, New York City. 399

WANTED

Advertisements under this head 25 cents for 25 words or less for each insertion. Set in bold face type $1.00 per insertion for 25 words or less.

POSITION WANTED as salesman by a practical telephone man with ability and sales experience. A hustler on missionary work. West preferred. Able to make friends and keep them. Address Box 380, The American Telephone Journal, 116 Nassau street, New York City. 380

WANTED—Men who have local lines in their charge to act as agents for our patent insulators. Send for circulars, sample and price. It will pay you. Address Claydon & Sons, Tabor, Texas. 386

WANTED—Every telephone man to send us your switchboard apparatus and instrument repair work. Coil winding a specialty. Our prices are low. We return work promptly. Address Jester & Millikan, Marion, Ind. 387

POSITION WANTED—By high grade technical man. Wide practical experience. Can show results in business, operating or construction departments. Good references. Address, Box 394, care The American Telephone Journal, 116 Nassau street, New York City. 394

POSITION WANTED—By a good technical and practical telephone man as salesman. Sales experience and has a territory in the Middle West which he can hold. Address, Box 395, care The American Telephone Journal, 116 Nassau street, New York City. 395

WANTED—Position as manager or superintendent of construction, by man who has had 10 years' experience. One who is not afraid of work. Address Box 392, care The American Telephone Journal, 116 Nassau Street, New York City. 392

WANTED—Position as exchange manager, not over 500 subscribers, or wire chief of larger exchange. Six years' experience in all branches of exchange work. References furnished. Address Box 397, care The American Telephone Journal, 116 Nassau street, New York City. 397

WANTED—Position as collector and solicitor with live and up-to-date telephone company. All around, practical man. Five years with present company. References furnished. Address Box 398, care The American Telephone Journal, 116 Nassau street, New York City. 398

WANTED—At once, experienced switchboard man for common battery board. Address Citizens' Telephone Company, Terre Haute, Indiana. 400

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The Telephone in the Courts

Conducted by A. H. McMillan.

Readers are invited to submit questions on any point of Telephone Law. They will be answered and explained on this page.

THE CARTY PATENT IS VOID.

Can you please tell me whether or not the so-called Carty patent (No. 449,106) is valid or not? P. G. T.

THE United States Circuit Court of Appeals has decided that the Carty patent No. 449,106 for improvements in telephone circuits and apparatus is void for lack of patentable invention. This decision affirms the decree of the Circuit Court of the United States for the Middle District of Pennsylvania. The latter Court held the patent void for lack of patentable novelty in view of the prior development of the art and the definite prior knowledge by the electrical profession of the principles upon which the invention framed therein rests, which renders a combination of devices shown, all of which were old, but the natural outgrowth of such development. The Carty device is of the multiple circuit construction, and at each station is a permanent bridge, in which is seated a Bell magnet, with a high coefficient of self-induction, and of marked impedance. There are also two other bridges, normally open, and closed only when a station is in use. The telephone bridge circuit, normally open, is closed in multiple arc with its own bell magnet, and, of course, with all others in the line when in use. The generator call circuit, normally open, when used, forms a second bridge or cross connection between the wires and parallel circuit, with a bridge circuit of its own bell and those of all others in the line. In operation, the tendency of the call current to short-circuit is counteracted by using a bell magnet of high self-induction and impedance. This not only prevents short circuiting, but effects a more even current distribution to the bell magnets of the entire system. By means of the numerous windings of the bell magnet, the small portion of the call current passing exerts a marked magnifying effect on the cores and a spirited working of the call signal. (Western Elec. Co. vs. Anthracite Tel. Co., 132 Fed. 547.)

REFUSAL OF COMPANY TO REMOVE TELEPHONE.

Can you cite us any case in which a telephone company was charged with refusing to take out an instrument and, when the subscriber was called, saying he would not answer? We are in such a predicament (charged with doing so, although we never did) and would like any assistance you can give. W. L. B.

SUCH a case occurred in the District of Columbia in 1894. A company, which had been directed by a subscriber to remove its telephone, refused to to do so, and continued to publish the subscriber's name in its territory, and, when persons who desired such subscriber's business services asked the company for connection with him, after making a feint of calling, replied that he would not answer. The court held that the company, in the absence of malice, was not liable to the subscriber for loss of business induced by persons so calling him, believing that he was not attending to his business. Cain vs. Chesapeake and P. Telephone Company, 3 App. D. C., 546.

INSTALLATION OF TELEPHONE IN EXCHANGE FOR RIGHT OF WAY.

IN order to secure the privilege of placing telephone poles on the farm of George W. Anderson, the Mt. Sterling Telephone Company, of Kentucky, agreed to erect and maintain a telephone in his house. This contract was not in writing, but was executed by the company erecting poles on the farm and installing a telephone in the house. After a time the company cut off Anderson's connection with the telephone line and threatened to remove the telephone box from his house. He accordingly brought suit for an injunction to prevent the removal of the telephone from his residence and to require the connection with the line to be maintained. The company contended that the suit could not be brought for the following reasons: (1) That it is for an interest in land; (2) that it was not to be performed in one year; (3) that there was no mutuality to support the contract; (4) that appellant had a complete remedy at law. The court held for the complainant upon all points and said: "The appellee under the contract in question obtained the use and occupancy of appellant's land with its telephone poles and wires for the consideration that they would furnish him service. The appellee's purpose is to hold what they had obtained under the contract and take from appellant that which they gave as a consideration for it." Anderson vs. Mt. Sterling Tel. Co., 86 S. W., 1119.

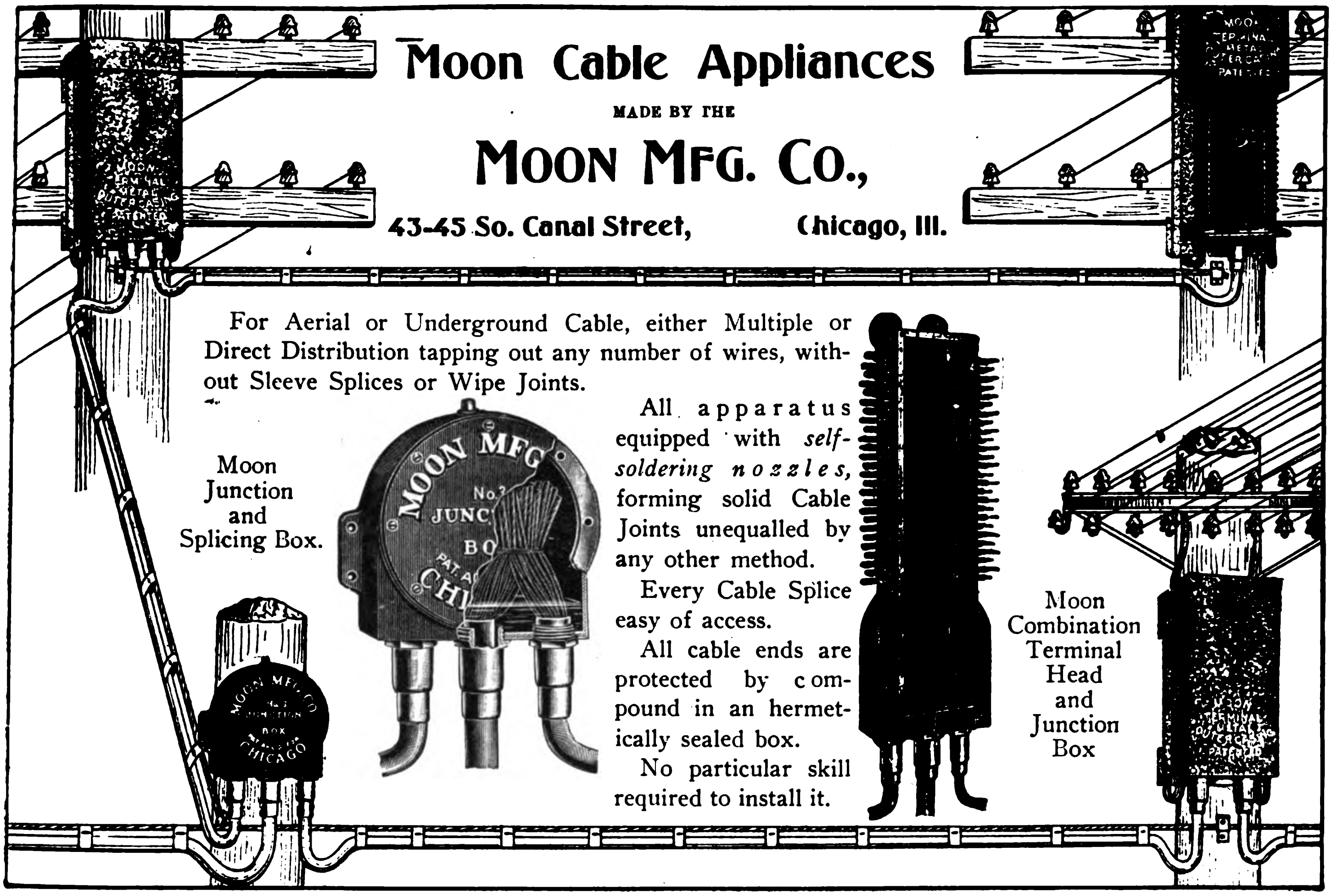
SUITS FOR VALUE OF INVESTMENT IN DEPRECIATED STOCK.

AT Waterloo, Iowa, L. C. Hanion has brought suit against P. K. Elliott to recover the value of $1,000 invested in shares of stock of the United States Telephone Company upon the hypothesis that the stock was worth par when the purchase was made. Recently the company and its plant was sold out at a foreclosure of $55,000. It has developed that 100,000 shares were put up in Chicago for a $24,000 loan. The articles of the company provide that the common stock shall not participate in the dividends until the same has been satisfied.

Another case growing out of a sale of stock in the same company is that of J. P. Puckett, of Traer, Iowa, vs. J. S. Gunther, of Waterloo, in which the jury have returned a verdict of $11,240 in favor of Puckett. The case was a land trading case and was hard fought, occupying the attention of the district court for over ten days. Puckett had traded to Gunther a stock of general merchandise at Traer which he claimed to be worth $30,000. Gunther gave him in exchange $5,000 worth of United States Telephone and Telegraph Company stock, of that city, which has proven to be absolutely worthless; 100 acres of Alabama land, claimed to be worth $25 per acre, which was shown to be worth but $2, and land in Minnesota and a house and lot in Cedar Falls. The case will be appealed.

PRINCIPAL AND AGENT IN SALE OF TELEPHONE POLES.

THE East Tennessee Telephone Company was sued for the price of 648 thirty-foot telephone poles at 80 cents each. The contract of sale was made with one Peck on behalf of the company and the poles delivered to the company's manager at Paducah, who received them but did not pay for them. The company denied that it bought the poles of the plaintiff, although it admitted having received them. But it claimed to have bought the poles of one Walker and to have paid him for them. It further appeared in evidence that Walker and Peck had jointly engaged to furnish the telephone company a quantity of poles. The money was paid by the company to Walker, who appropriated it and did not pay the plaintiff. In giving the money to Walker the company had told him to turn it over to the plaintiff. The court therefore held that Walker was the company's agent, at least in making payment to plaintiff, and if he had not turned over the money it was the company's loss and that they must see that the plaintiff was paid. Luttrell vs. East Tennessee Telephone Company, 86 S. W., 1124.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Ohmmeter and Faradmeter

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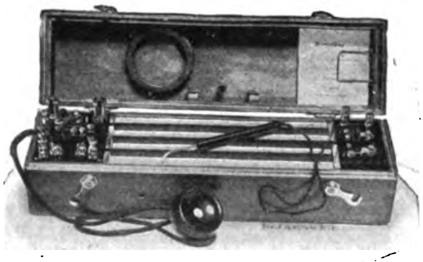

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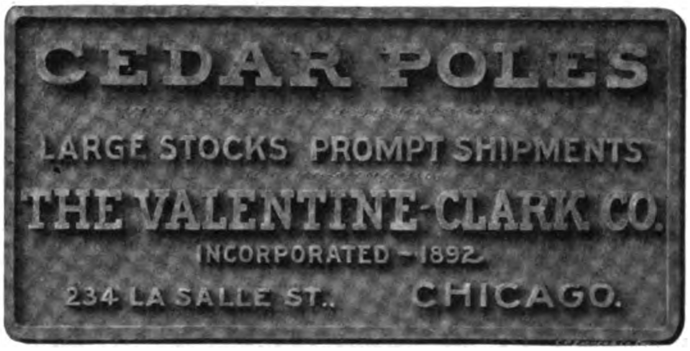

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TELEPHONE PATENTS

SIGNAL INSTRUMENTS.

Henry M. Crane, New York, N. Y., Patent No. 789,208, dated May 9, 1905, filed January 2, 1904, and assigns to Western Electric Company, Chicago; a signal instrument for telephone substations. The object of this invention is to provide a simplified call signal device, which will be compact and inexpensive. Referring to Figs. 1 and 2, a is the usual type polarized signal magnet mounted upon a wooden base b, which may also support a condenser c and induction coil d. A thin metal cover e fits over the back b and is secured thereto by screws ff, thus concealing and protecting the apparatus. For signaling purposes two lugs c^2c^2 are so mounted upon the cover that the tapper a^2 of the polarized bell when in operation will strike each one alternately. On account of the attachment of the lugs c^2 to the cover, which serves as a resonator, a loud rattle is produced when the tapper is actuated, which will be as clearly audible as the signal produced when the usual gongs are employed.

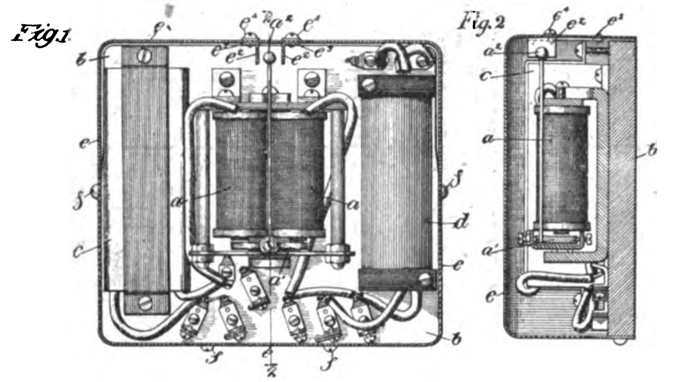
Fig. 1. Fig. 2

COIN-CONTROLLED TELEPHONE SYSTEM.

Charles W. Mahon, Chicago, Ill., patents No. 789,925, dated May 16, 1905, filed September 6, 1904, an improved coin-controlled telephone system. The object of this invention is to provide an automatic pay station for automatic telephone systems, so that the calling party is compelled to deposit a coin before he can establish communication with the party called.

INTERRUPTER.

Maurice K. McGrath, Antwerp, Belgium, patents No. 789,814, dated May 16, 1905, filed October 21, 1904, and assigns to the Western Electric Company of Chicago, an improved form of interrupter. The essential feature of this invention consists of the employment of a heavy non-resilent framework to enclose the parts, so that they may not be affected by extraneous vibrations, nor permit their vibrations to be communicated to surrounding objects. This the inventor accomplishes by the employment of a frame b, made preferably of lead, and having two standards b^2 and b^3 between which is mounted the electro-magnet a and its return poles a^1 and a^2. The armature a^4 is arranged to operate in its movement a pair of contacts which are carried upon a bridge piece d. These contacts consist of spring c and an adjustable contact screw c^1. The armature carries an insulating button f adapted to engage the spring c, and move it away from engagement with contact e^1 when the armature is attracted. As the contacts e e^1 are included serially in the circuit of the magnet winding a, the vibration of the armature will cause the make and break of the circuit through this winding and through apparatus such as an induction coil, which might be included in that circuit.

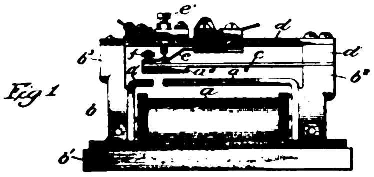
Fig. 1

COMBINED DROP AND JACK.

Henry Sideman, Menominee, Mich., patents No. 789,188, dated May 9, 1905, filed August 13, 1904, an improved form of a combined drop and jack for switchboards. The object of this invention is to provide a combined jack and drop of simplified construction. Referring to Fig. 1 the numeral *1* indicates a mounting plate which carries the electro magnet *2*, the jack *19* and shutter *15*. Pivoted upon the pin *16* but movable with relation to the shutter is a rearwardly extending link *21*, so formed that when the shutter is down its rear end will be within the path traversed by the plug *22* in its passage into the jack, Fig. 5. As the plug is pushed farther into the jack, the link *21* is forced downward causing the forward end to engage the shutter and lift it into its normal position, Fig. 6, where it is held in position by latch *14*.

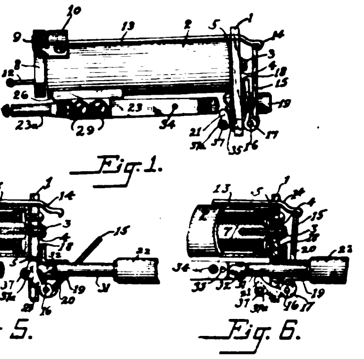
Fig. 1.

Fig. 5. Fig. 6.

ELECTRICAL TEST SET.

Alva J. Carter, Idagrove, Iowa, patents No. 789,256, dated May 9, 1905, filed December 23, 1902, an electrical test set. The object of this invention is to produce in the smallest possible space a test set which has a large range of operation. This the inventor accomplishes by the use of two switching keys, each having a plurality of contacts, a generator which is so connected as to give either alternating or pulsating current at will, a buzzer and a watch case receiver. By manipulating the switching keys various testing circuits can be formed of a more elaborate nature than is possible with the ordinary test set.

CABLE HANGER.

Nils A. Yetterlund, Duluth, Minn., patents No. 789,830, dated May 16, 1905, filed November 25, 1904, a cable hanger. This invention consists of an improved form of cable hanger made of three strips of metal hinged together. The upper of these strips loops over the messenger wire and has its free end reduced in size to pass through holes in the central strip and in the lower end strip. The central and lower end strips encircle the cable, and when in position are locked together by the reduced end of the upper strip passing through holes therein and being bent into a locking position.

LE ROY W. STANTON

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Chicago, Illinois

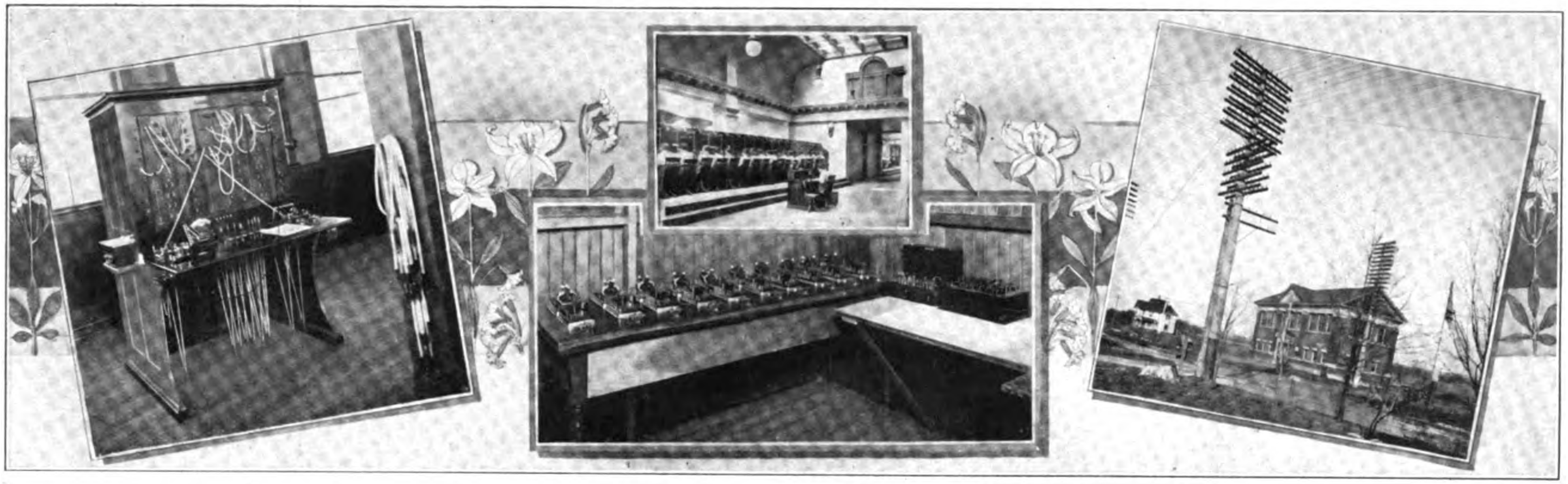
A Leading Financier has Stated that the Trained and Experienced Engineer is a Decided Factor in the Economy of Modern Industry.

The true engineer judges what equipment will give the best service and produce the greatest earnings on the capital invested. He takes into consideration the first cost, the cost of operation and maintenance, and the loss through depreciation. And, last but not least, what the dividends will be, not for one year or two years, but over a long period of time.

These results are only obtained through true engineering, broad experience and a keen sense of real economy.

VIEWS OF THE UNITED STATES TELEPHONE COMPANY'S LONG DISTANCE SIMULTANEOUS TELEPHONE AND TELEGRAPH EQUIPMENT

This Equipment was first planned and installed under the supervision of L. W. Stanton while engineer for this company.



Switching Panel for Composited Long Distance Telephone and Telegraph Lines.

A Bank of Telegraph Relays and Repeaters, used in simultaneous Telephone and Telegraph Transmission.

Telegraph and Telephone Switching Station, Thompson's Corner, O.

Upper central view shows a portion of one division of Cuyahoga Telephone Company's Four Division Board, which has been considered by leading telephone engineers to be the largest and most complicated piece of switchboard mechanism ever installed. Same was installed under the supervision of L. W. Stanton, who was later Traffic Manager and General Superintendent of the telephone properties of the Everett-Moore Syndicate, including the Cuyahoga Telephone Company of Cleveland, the subsidiary companies of The Federal Telephone Company, and the United States Long Distance Telephone Company.

Organizing Ability of Highest Order.

Cleveland, Ohio, Jan. 29, 1904.

While Mr. LeRoy W. Stanton was in the employ of the Federal Telephone Company, I considered his ability in organizing the working forces for the best and most economical results to be of the highest order.

Yours very truly,
H. A. EVERETT.

Highest Efficiency—Increased Earnings—Decreased Expenses.

Cleveland, Ohio, March 30, 1904.

When Mr. L. W. Stanton was with the Federal Telephone Company his motto was higher efficiency, increased earnings and decreased operating expenses. The indications are that he has kept those points well in view since leaving us.

Yours truly,
JAS. B. HOGE, Vice Pres.
Federal Telephone Co.

I furnish plans and specifications and supervise the installation of complete telephone plants, including underground and aerial construction, building design and installation of equipment.

I WILL INSTALL OR RE-CONSTRUCT FREE OF CHARGE

the telephone plant of any person or company if they can show in the United States a telephone plant as *economically or as well built, or one that will earn within 5 per cent. as large a dividend on the capital invested, for ten consecutive years* (rentals and size of plant being equal) as some of the late plants I have built. This is due to the method of construction, attention to details, and to an intimate knowledge of all phases of the business.

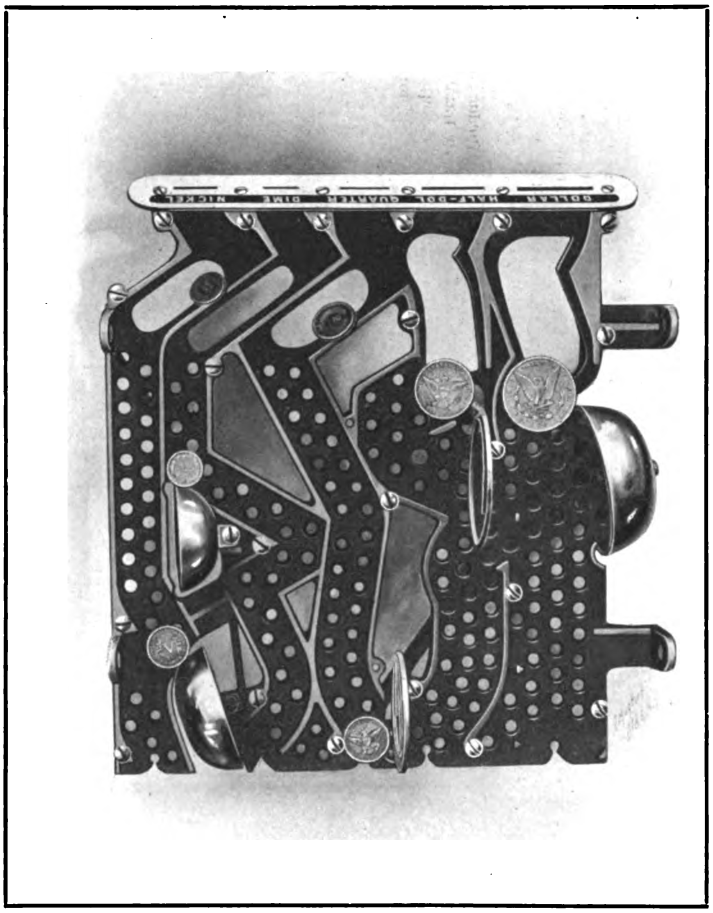
This is worth investigating by any company expecting to build or re-construct.

IN THE MANUFACTURING FIELD

"SUCCESS LIES IN THE KNOWLEDGE OF OUR TOOLS"

THE AUTOMATIC FEATURE OF GRAY PAY STATIONS.

In the accompanying illustration is shown the gravity principle employed by the Gray Telephone Pay Station Company of Hartford, Conn., for the collection of telephone charges of any amount. By simply dropping the coins in the slot, the operator at the central office is notified automatically of the amount deposited by the calling party, as each coin comes in contact with an audible signal, placed in its path on the channel board. The several openings at the top of the channel board are intended for the rejection of false coins, pennies, etc., which drop through these openings and perform no function. The several V-shaped openings at the lower edge of the channel board corresponding to each runway prevent the operating company being defrauded by the user attempting to manipulate a coin attached to a string in such a way that the coin might be withdrawn after sounding the signals.



From a Photograph Showing the Gravity Principle and Operation of the Gray Automatic Pay Station.

In this station the difficulty encountered by telephone companies, of users dropping gunwads in the slots and getting free service, is overcome. While a gunwad in this machine passes down through and strikes the several signals in its path, it gives no sound. The code of signals on these machines is extremely simple and there can be no confusion at central office; a nickel rings one blow on a cup bell, a dime two blows on a cup bell, a quarter one blow on a clock gong, a half dollar two blows on a clock gong, a dollar gives one blow on a large deep bell and comes in contact with several cast projections in its path making a rattle.

It will be noticed that with this code of signals, two nickels give the same signal as one dime, two quarters the same as one half dollar, thus simplifying matters for the operator.

The company wishes to draw attention to the fact that this type of station contains the two vital points in telephone practice—quick service and low maintenance.

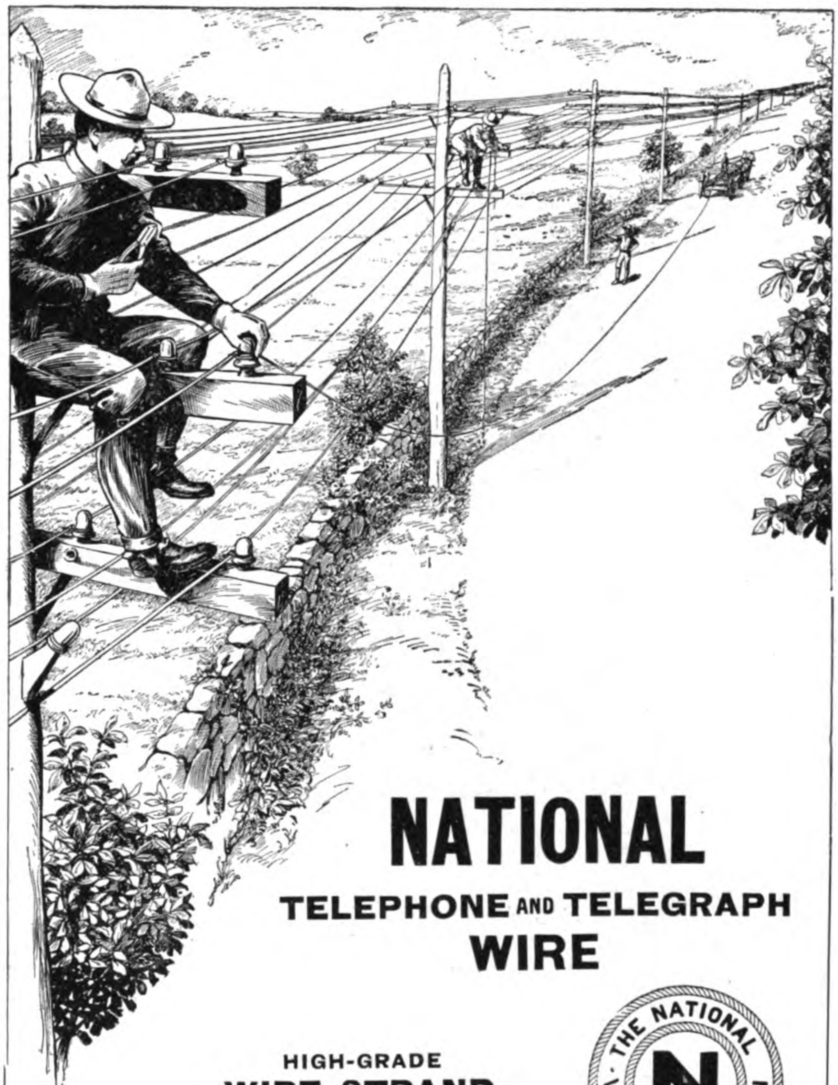
G. M. Gest, the subway contractor of New York and Cincinnati, has just been awarded the contract for the construction of a complete underground conduit system for the Montreal Light, Heat & Power Company at Montreal, Canada. Over a million feet of conduit is to be used in the construction.

The Century Telephone Construction Company, Buffalo, N. Y., has received an order for switchboard, telephones and construction material for the West Lakeside Telephone Company, Skaneateles, N. Y. It is installing at the present time a common battery switchboard equipment at Sayre, Pa., for the Waverly Telephone Company. It also reports a large increase in the demand for its telephones equipped with platinum electrode transmitters, and also for the No. 95 outside cable head.

The Challenge Manufacturing Company, 365 Market street, Newark, N. J., is placing on the market a new type of battery cell called the Challenge, which has several points of interest. It is a primary battery, having a large output with long life. In its construction the parts are so arranged that it is not necessary to handle any that have been in contact with the solution, thus making it possible for the cell to be renewed without soiling one's hands. Four types have so far been designed, ranging in capacity from 150 to 500 ampere hours. The internal resistance of the cells varies from .05 ohms to .018. The manufacturers recommend this cell for all places where an open or closed circuit battery can be used. A folder giving prices and further information will be sent upon request.

The Fres-Ko Chemical Company, Ft. Wayne, Ind., is mailing two pictorial cards which illustrate the difference between good and bad joints, and draw attention to the merits of the Fres-Ko soldering paste. This paste the manufacturers claim, besides making good joints, also preserves them. The company will mail the cards upon request.

The National Wire Corporation, New York, with branch offices in Boston, New Haven, Chicago, Atlanta, San Francisco and Kansas City, is distributing a brochure dealing with iron and steel wire and wire strand. A table is furnished giving weights and resistance of E. B. B., B. B. and steel wire in the different gauges from 4 to 14. Attention is called to the guarantee, that all telephone and telegraph wire is extra double galvanized with the purest zinc it is possible to secure. In wire strand for messenger purposes this company has four grades, which range in test from not less than 90,000 pounds per square inch tensile strength to not less than 225,000 pounds in the extra high strength quality. If the standard grades do not meet the requirements of any specifications the company will furnish estimates upon the quantity and quality desired. The company is able to make immediate shipments, and will quote prices and furnish other information to all parties interested.



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TELEPHONE AND TELEGRAPH
WIRE

HIGH-GRADE
WIRE STRAND

Is the very best grade of material possible to produce.

Our new circular tells why. May we send you a copy?

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IN THE MANUFACTURING FIELD

EXPANDED METAL LOCKERS.

LOCKERS are no longer considered a luxury, but an indispensable part of well-equipped and well-regulated telephone exchanges by all up to date companies.

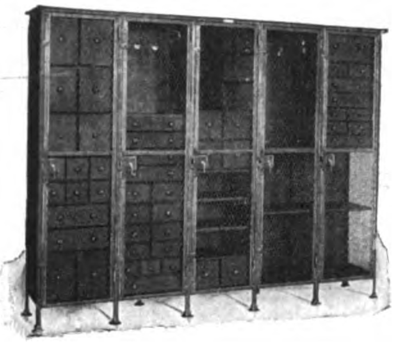
In an experience of many years in locker building, Merritt & Company, whose offices are at 1010 Ridge avenue, Philadelphia, and factory at Camden, N. J., has found that no locker will be thoroughly satisfactory which does not combine sanitary qualities, security to the belongings of the occupant and durability; not only general durability of the main structure, but also in all details, such as hinges, hooks, lock fastenings, etc., every part must be strong and bear careful examination. All these features have been incorporated in the expanded metal lockers which it manufactures.

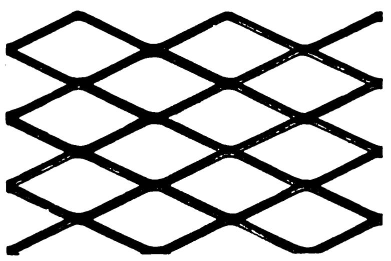
For lockers, sheet steel is cut almost into wire, leaving bits not cut, and then pulled apart; the result is a network of solid steel of one piece with ¾-inch meshes, the same as wire would be if the wires could be welded together at crossings. In this way a foot of sheet steel is stretched to the width of five feet. The net is as strong against breaking as wire, and cannot be opened by slipping, as wire net can. Sheets of larger mesh are used for tool room enclosures, elevator screens, window guards, etc.

These lockers are made in any size, either single or double tier. The "unit type" is made in three sizes, 12 by 12-inch, 14 by 16-inch and 15 by 20-inch.

The company will send sample of expanded metal or booklet upon request.

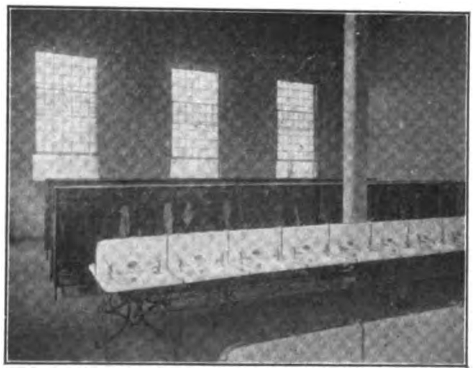
Material and Tool Closet made of Expanded Metal by Merritt & Company, Philadelphia.





Expanded Metal used in construction of Merritt & Co.'s Steel Lockers.

THE G AND C DRY BATTERY COMPANY, 54-56 West Third street, New York, is manufacturing a portable storage battery which has several advantages. In place of the usual liquid electrolyte, an electrolyte of solid consistency is employed which does away with the trouble of liquid leakage. This material, which is spongy in character, besides serving as the electrolyte, also acts as a separator to keep the plates from coming in contact and short circuiting. The plates are designed so that the active material is held rigidly in place, and at the same time bending is prevented. The positive plates are guaranteed from two to three years, and the negative plates from four to five years. The containers are made of unbreakable celluloid, which greatly reduces the weight of the cell. Each battery is fitted in a leather skeleton carrying case, which makes it easy to handle. All the trimmings are made from brass and are heavily nickel plated. Batteries are shipped fully charged to any part of the United States, and the charges will last for six months or over when not in use. Catalogue and further information furnished upon request.



Locker room equipped with standard size single tier Expanded Metal Lockers.

THE WESCO SUPPLY COMPANY, St. Louis Mo., has issued the fifth number of the third volume of its advertising publication entitled the "Live Wire." This paper contains some very bright and interesting matter. The regular departments are still maintained and besides a bargain list is included of a varied line of material for electrical purposes. This pamphlet will be mailed free to parties interested.

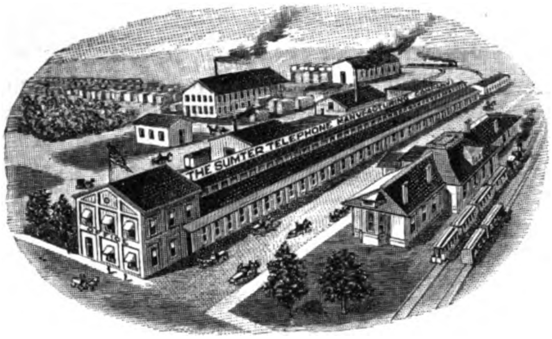
R. W. KEMP, telephone engineer of Wellington, Kan., has sold part interest in his business to F. M. Kemp, W. K. Wise, William Warren and M. B. Pile, who have organized the Mutual Telephone Engineering and Supply Company, incorporated for $5,000. The business will continue on a larger scale and include the entire Southwestern States. The new company has now under construction several large contracts that will employ nearly 100 men. It will also carry on hand all kinds of supplies and material for construction work.

INDEPENDENT MANUFACTURERS COMPETING IN FOREIGN TRADE.

ONE of the American manufacturing companies which has had excellent success in securing foreign trade is the International Telephone Manufacturing Company of Chicago.

Among the many foreign contracts recently secured by this company are: a complete exchange system, consisting of self-restoring drop switchboard and telephones for the Saint Catherine and St. Bastile Telephone Company of St. Catherine, Quebec, Canada; a complete central energy equipment for railway service shipped to Apostolos Agathocles at Athens, Greece; a shipment of telephones for increasing the public service system of the municipality of Neepawa, Manitoba, Canada; a complete central office switchboard equipment and telephones for the public exchange at Santa Rosalia, Chihuahua, Mexico; additional apparatus for the 1,000-line capacity central energy lamp signal switchboard and central energy telephones for the town of Fort William, Ontario, Canada; additional apparatus for the 2,400-line capacity self-restoring drop multiple switchboard for the Comp. Telephonica do Estado de S. Paulo of Sao Paulo, Brazil; and a large order for central energy telephones for the public service exchange at Port Arthur, Ontario, Canada.

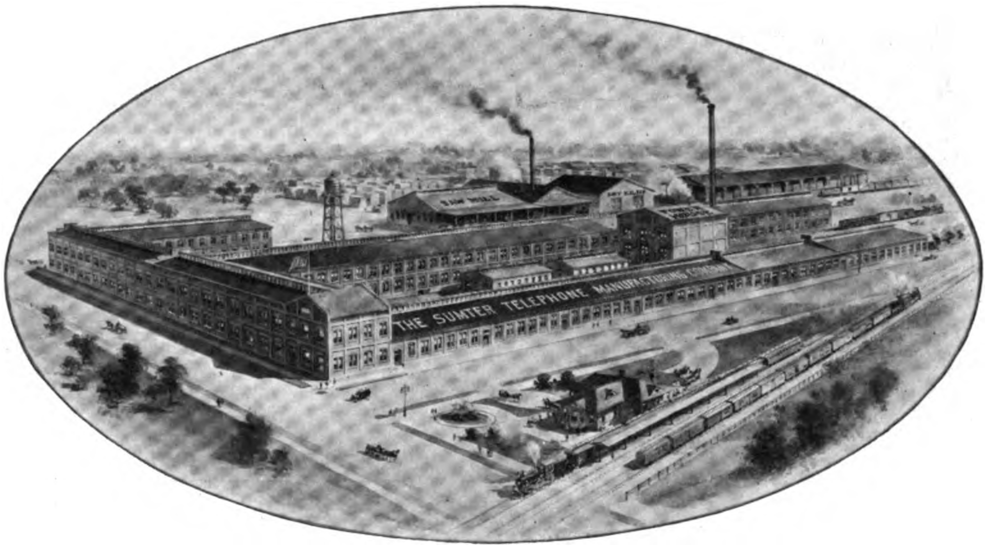
THE NATIONAL BATTERY COMPANY, Buffalo, N. Y., has used the installation of its unit type storage cell installed in the plant of the Frontier Telephone Company at Buffalo, N. Y., as a basis for a very interesting bulletin known as No. 1. Two sets of batteries are used, each of 11 cells. The type employed is known as the 9 x unit accumulator, having a capacity of 640 ampere hours. These cells are installed in type 15-X, lead lined wooden tanks, this large size being used to allow the addi-



if-
You know us,
You know
The reason
why.

5 Years Ago.

A Little Light
Upon Our Growth.


THE SUMTER TELEPHONE MANUFACTURING CO.

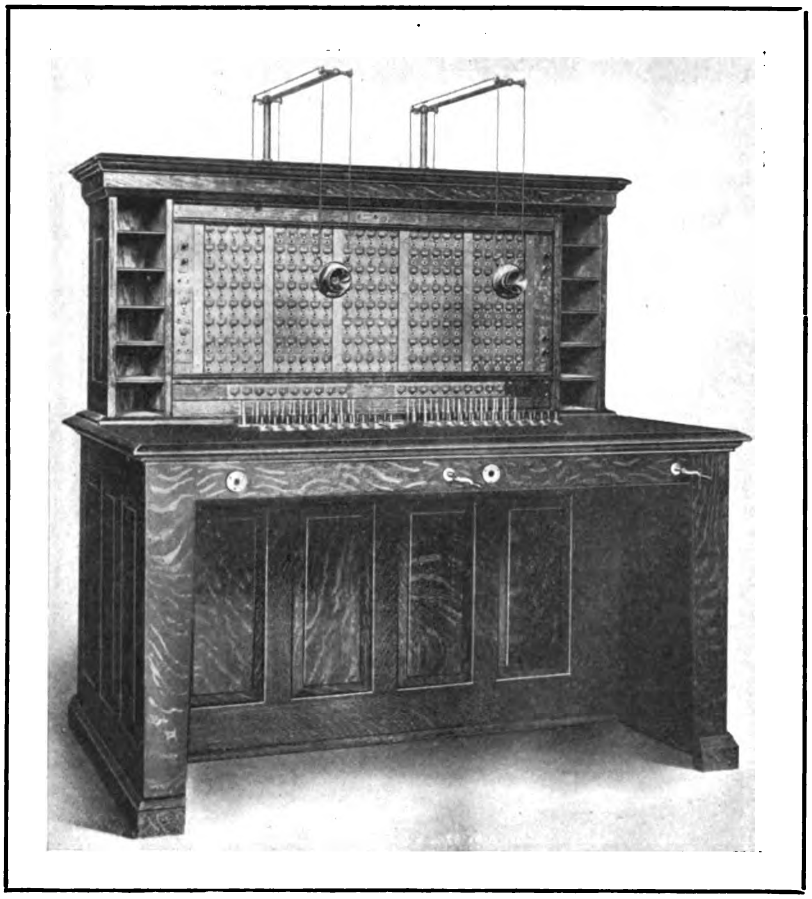
To Day

The
Sumter Tel. Mfg. Co.,
Sumter, S.C.
U.S.A.

tion of more plates as the system grows. The battery is charged from a 5¼ K. W. 30 v. generator located in the basement of the building. The normal charging current is 80 amperes. This plant supplies the central office as well as 51 private branch exchanges. The company will be pleased to send this bulletin to parties interested in storage cells for telephone purposes.

A NEW PRODUCT OF THE MONARCH COMPANY.

THE Monarch Telephone Manufacturing Company asserts that in Monarch telephones simplicity has always been a vital consideration. The removable shelf feature of its telephones, which makes it possible to remove any of the parts from the instrument without disturbing the permanent wiring, is familiar to almost everyone. This same idea of simple, substantial construction has been carried out in its new switchboard. The drops are so made, that the coils can be removed from the shells without disturbing the adjustment of the armature and without breaking any soldered connections. The armature is placed in front of the coil instead of at the rear. In addition to the convenience in manufacture, this point permits a more sensitive drop, as the length of the shutter hook is greatly reduced, with a corresponding reduction in the amount of power needed to operate the drop.



New 200 Line Switchboard Cabinet, provided with pigeonholes. Designed by the Monarch Tel. Mfg. Co., Chicago, Ill.

From the accompanying illustration of a 200-line board, a good idea can be secured of the general character of the board. The cabinet work is specially designed for small exchanges of from one to two hundred lines, and is arranged so that either one or two operators can handle calls. No special chairs are necessary, as the table of the board is no higher than an ordinary flat-top desk. The pigeon holes at either side of the drop and jack cabinet are a great convenience to operators, especially where toll lines enter a local exchange. The woodwork is quarter sawed oak.

The board just described was shipped a short time ago to the Markle Telephone Company, Markle, Ind., where it is now installed and is giving complete satisfaction. Other exchanges recently built by the Monarch Company are as follows: 100-line board for the Burchard Telephone Company, Burchard, Neb.; 200-line board for the Wagner Telephone Company, Wagner, S. D.; 200-line board for the Commerce Telephone Company, Commerce, Tex.; 100-line board for the German-American Telephone Company, Orlando, Okla.; 300-line board for the Elk Point Telephone Company, Elk Point, S. D.; 300-line board for the Rural Telephone Company, Pond Creek, Okla.

Many other boards of various sizes have been built during the past two months, and in every case the best of service has been secured. The Monarch Company claims that an unusual record has been established for its switchboards, as up to date, not a single case of serious trouble has developed in any that have been placed in service. This it attributes to the simplicity and efficiency of mechanical construction.

The company has recently published a new catalogue which contains more than fifty half-tone illustrations, showing every part as well as several of the complete equipments. It is handsomely designed and should be of interest to all parties in the field. To secure a copy address the Monarch Telephone Manufacturing Company, 10-16 South Clinton street, Chicago, Ill.

JULIUS ANDRAE & SON'S COMPANY, Milwaukee, Wis., has prepared a new catalogue, No. 11, in which is listed and described a complete line of telephone apparatus. Particular attention is called to the Andrae telephone condenser, which when placed at subscribers' stations enables the operator to ring with the receivers off the hook. This condenser is fully guaranteed.

THE NORTH ELECTRIC COMPANY, Cleveland, O., is placing on the market a desk stand of exceptional merit. The column is metal and heavily plated, to prevent it becoming brassy through handling. The base is furnished either in standard enamel or else in nickel plate and is provided with a leather ring around the bottom, which prevents its marking the furniture upon which it may be placed. All the mechanism is contained in the column, which is so devised that by the removal of one screw all the working parts can be exposed. This desk stand, together with a number of other improved devices, are described in catalogues which the company will mail to intending purchasers.

THE S. H. COUCH COMPANY, 162 Pearl street, Boston, Mass., is manufacturing an automatic intercommunicating system which is worthy of examination. It is simple to connect up, uses central battery and is non-interfering. It can be arranged for branch exchange work, and when so equipped it has trunk line connection to the main office. Parties interested should, when writing, ask for information relative to the No. 38 instrument.

THE BUFFALO STEEL COMPANY, Tonawanda, N. Y., is manufacturing a high grade line of cross-arm braces. The material used is the best quality Bessemer steel, which shows a tensile strength twice that of soft steel or iron.

Kellogg Switchboard and Supply Co.
CHICAGO, ILL.

Wholesalers of
Michigan White Cedar **POLES** of **QUALITY**

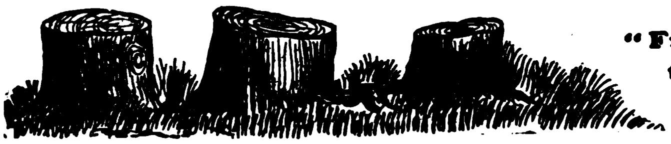
Five Yards *Prompt Shipments*

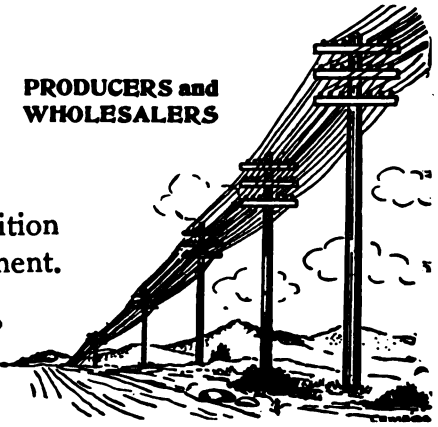
PITTSBURG & LAKE SUPERIOR IRON CO.,
ESCANABA, MICHIGAN.

PRODUCERS and WHOLESALERS

WE always carry a large stock of all sizes of White Cedar Poles, and having yards on all principal railroads in Northern Michigan and Minnesota, are in position to make immediate shipment.

"From the Stump to the Line."





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CEDAR POLES

Is very large at present. They are straight, sound and strong. Particularly well adapted for

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We have them in assorted sizes and at prices that will certainly suit

Write us now for quotations

Sand Point Cedar Co.
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WHITE CEDAR POLES

We can furnish anything in White or Idaho Cedar Poles, and it won't cost you anything to get our prices. Write us.

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CEDAR POLES

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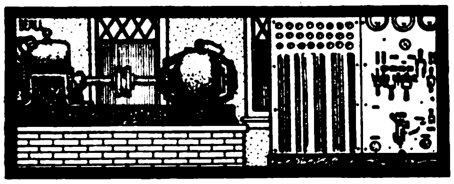
WM. MUELLER COMPANY
1211-12-13 MARQUETTE BLDG. CHICAGO.
SEVEN DISTRIBUTING YARDS



QUERIES

Questions on any subject relating to telephony will be answered on this page.

BELL A BOARD CIRCUIT.—(569.)

Will you please show me how the cables run from the main frame to the *A* operators' positions of a Bell common battery board. T. P. S.

The cable routes from the main frame to the intermediate frame and to the multiple and answering jacks are shown in Fig. 569. It must be understood, however, that in different localities different schemes are employed. For instance, in some places the subscriber's line is first brought to the horizontal side of the main frame and from there cross connected to the vertical side. This method has a supposed advantage that in testing for trouble the line can be opened at the horizontal side and an immediate test made to find out whether the trouble is inside or not. It will be noticed that two cables are run from the vertical side of the intermediate frame, one to the answering jacks and the other to the relay rack; also that the cable to the multiple is run from the horizontal side. The reason for that is this: The position of the multiple jacks and relays is permanent, but it is possible to cross connect any desired answering jack and line lamp to any desired multiple. In this way it is possible to distribute the incoming lines so that no one operator has to attend to too many busy lines.

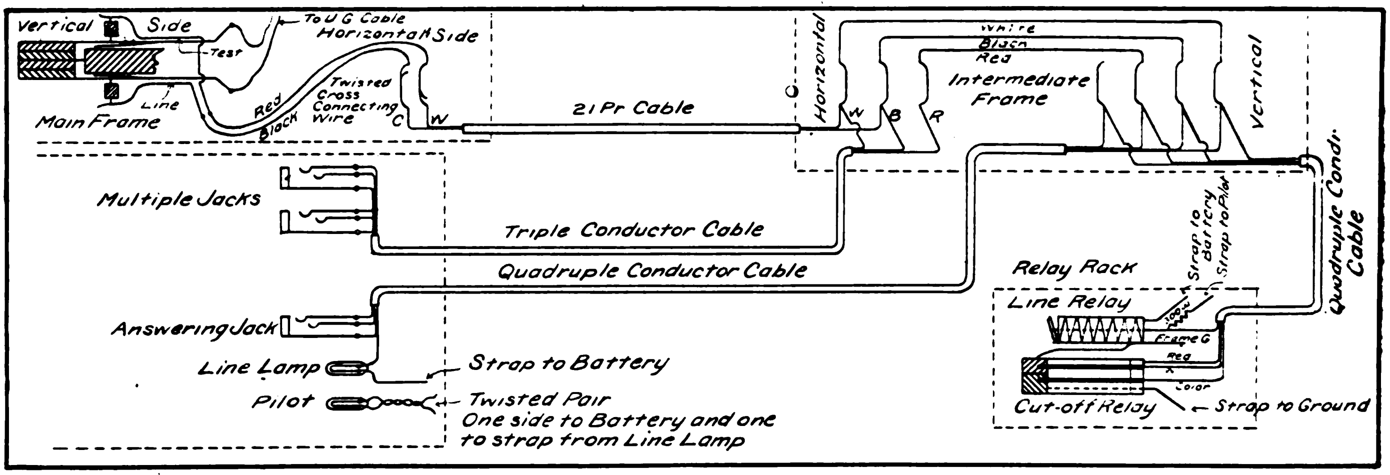


Fig. 569.

The diagram will be found self-explanatory and therefore no further comment is necessary except to state that the letters adjacent to the horizontal terminals of the intermediate frame indicate the color of the cross-connecting jumper and stand for white, black and red.

OPERATOR'S CUT-OUT BUTTON.—(570.)

I have noticed on our switchboard a button which the operators use when listening on long lines. I am told it is to cut out the noise from the transmitter. How is this accomplished? S. T. C.

Your query is rather vague, but we suppose you mean a button that is sometimes employed to short circuit the secondary winding of the induction coil to help listening on long lines. The method of connecting in the key is shown in Fig. 570, where it will be easily seen that when the button is pressed a short circuit is formed around the secondary of the induction coil. This cuts out the impedence offered by the induction coil and thereby aids the operator in hearing such sounds as would otherwise become too faint. The scheme is rarely employed nowadays, as the circuits are so designed as to do away with the necessity of such a button. In some instances, when there is much noise, a button is cut in, as illustrated, to prevent the noise picked up by the transmitter being reproduced in the secondary circuit while a party is listening.

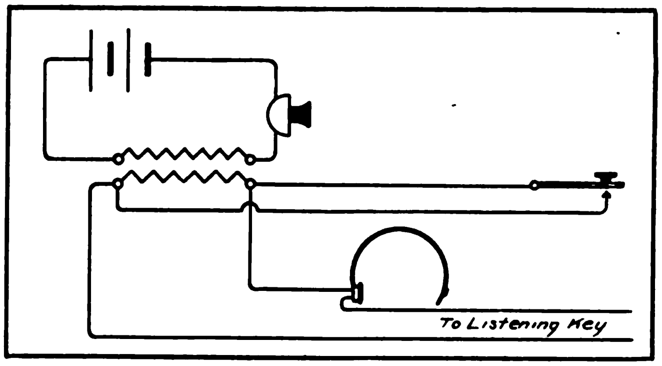


Fig. 570.

ANTI-HUM DEVICE.—(571.)

We are much bothered with the wires of our telephone making a disagreeable humming noise. Can it be prevented? O. P. R.

Two methods of overcoming the trouble you mention are shown in Fig. 571. One is to form a coil *D* before tying the line to the insulator *C*. The other is to wrap a piece of rubber *B* around the insulator *A* in the groove, as shown, and then tying the line wire in position over it.

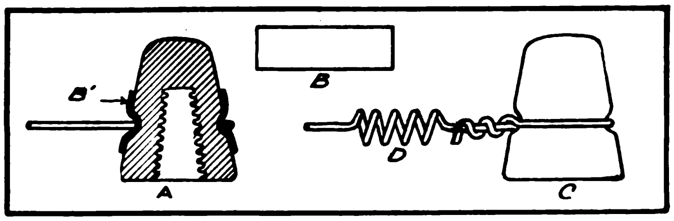


Fig. 571.

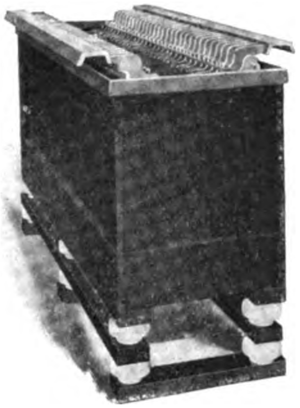
The reason for either scheme is to form a spring support which will absorb the vibrations and thus prevent them from being communicated to the building through the insulator and pin.

SCIENTIFIC DESIGN **RUGGED CONSTRUCTION**

Built For Hard Service

The Bijur "High-Duty" Storage Battery

General Storage Battery Co.
42 Broadway, - - New York



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Especially Designed For
TELEPHONE EXCHANGES
Blanks, Books and Forms for Telephone Exchange and Toll Line Bookkeeping and Accounting

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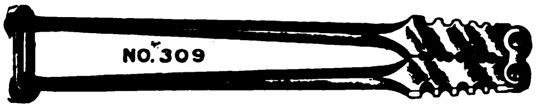
Write for Sample Forms and Prices.

The Telephone Printing Co.
DEFIANCE, OHIO.



No. 309 Reversible Combination Wire and Sleeve Clamp.
Send a two-cent stamp for 48-page catalogue.

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SATISFACTION
KLEIN'S TOOLS ALWAYS GIVE IT
MATHIAS KLEIN & SONS
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EXPANDED METAL
LOCKERS
Sheet Steel Material Closets
MERRITT & CO., 1010 Ridge Avenue PHILADELPHIA

BUTTERFIELD, J. F.
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Complete Telephone Exchanges Built and Material Furnished.
Cable Construction and Underground Conduit Construction a Specialty.
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DIRECT READING

Voltmeters, Ammeters, Millivoltmeters, Voltammeters Milammeters, Ohmmeters, Portable Galvanometers, Ground Detectors and Circuit Testers.

Our Portable Instruments are recognized as THE STANDARD the world over. Our STATION VOLTMETERS AND AMMETERS are unsurpassed in point of extreme accuracy and lowest consumption of energy.

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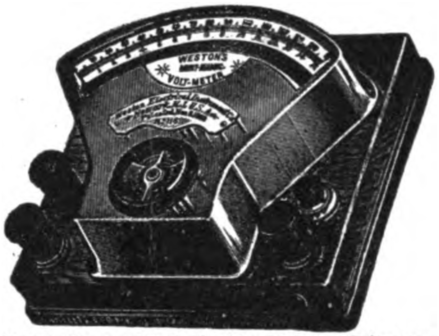
Berlin—European Weston Electrical Instrument Co., Ritterstrasse, No. 88.
London—Elliott Bros., Century Works, Lewisham.
Paris, France—E. H. Cadiot, 12 Rue St., Georges.
New York Office, 74 Cortlandt Street.



Weston Standard Portable Direct Reading Voltmeter.

OKONITE
TRADE MARK.

1889—Paris Exposition Medal for Rubber Insulation 1893—World's Fair Medal for Rubber Insulation

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WILLARD L. CANDEE, } Managers
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W. H. HODGINS, Secretary

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all apparatus that we make. That is the reason why our apparatus is used exclusively wherever introduced. Candidly speaking, don't you think you had better investigate our claims before placing your next order elsewhere?

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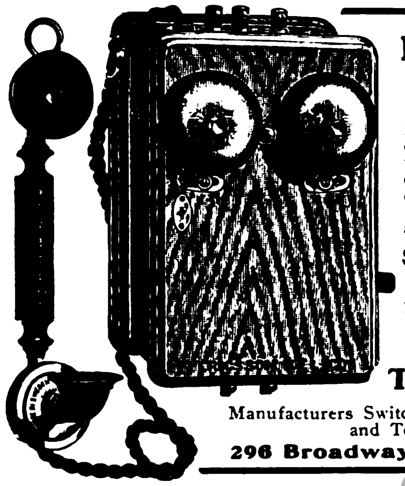

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ERICSSON TELEPHONE CO.
Manufacturers Switchboards, Party Line Telephones and Telephone Supplies.
296 Broadway NEW YORK CITY

THE WEEK'S MESSAGES

FINANCIAL.

COLLINSVILLE, CT.—The Farmington Valley Telephone Company has increased its capital stock from $27,000 to $54,000.

LAINGSBURG, MICH.—The Laingsburg Telephone Company will increase its capital stock from $25,000 to $100,000.

PATASKALA, O.—The Pataskala & Hebron Telephone Company, Pataskala, has increased its capital stock from $65,000 to $100,000.

SANDUSKY, O.—The Sandusky Telephone Company has decided to increase its capital stock from $75,000 to $150,000.

FRANCHISES.

BLOOMINGTON, ILL.—The Home Telephone Company has applied for an extension of its franchise for ten years. If the extension is granted the company contemplates extending its lines.

RISING SUN, IND.—The City Council has granted a franchise to the Farmers' Telephone Company.

MT. UNION, IA.—The Henry County Telephone Company has applied for a franchise at Mt. Union.

BEATTYVILLE, KY.—The Booneville and Burning Spring Long Distance Telephone Company has been granted franchises to erect and maintain telephone lines in Beattyville, and extend its lines in Lee county.

DALLAS, TEX.—A franchise has been granted to the North Texas Independent Telephone Company to extend its lines into that city.

COALVILLE, UTAH—J. M. Lockhart has been granted a telephone franchise at Coalville.

BEAUX BRIDGE, LA.—The Bertha Telephone & Telegraph Company has applied for a franchise at Beaux Bridge.

COMBINATIONS.

BOLIVAR, N. Y.—The Bolivar Telephone Company has purchased the Oswego Telephone Company's plant.

ELECTIONS.

AINSWORTH, NEB.—The Keya Paha & Brown County Telephone Company has elected the following officers: President, Charles Hinneman; vice-president, Frank Sellors; secretary, F. A. Baldwin; treasurer, R. E. Jones.

SHERMAN, KAN.—The Sherman Telephone Company has elected the following officers: President, J. A. Patterson; vice-president, E. L. Green; secretary, C. D. Stewart; treasurer, A. J. Sweet.

HILLSBORO, N. D.—The following officers have been elected by the Traill County Telephone Company: A. T. Kraabel, president; A. C. Foogman, vice-president and treasurer; John Carmody, secretary and treasurer.

MEDFORD, OKLA.—The Grant County Rural Telephone Association has elected the following officers: President, O. F. Hendricks; vice-president, E. E. Flora; secretary, S. D. Million; treasurer, S. Long.

UNDERGROUND.

ONEIDA, N. Y.—The Central New York Telephone Company of Syracuse has applied for a franchise to place its wires underground in Oneida.

NEW COMPANIES.

PANOLA, ILL.—The Farmers' Telephone Company, Panola, Ill., has been incorporated with a capital stock of $1,300. Incorporators: Frank M. Taylor, V. M. Risser and J. H. Roth.

ELDON, IA.—The Farmers' & Merchants' Mutual Telephone Company of Eldon has been organized. J. R. Moore, president; J. H. Spilman, vice-president; E. E. Hilles, treasurer; J. Mose McClure, secretary.

ELDON, IA.—The Eldon Mutual Telephone Company has been incorporated.

WATERLOO, IA.—The Corn Belt Telephone Company is the name proposed for the new Independent telephone company, which has recently acquired by purchase the plant of the United States Company. It is proposed to place the capital at $300,000. Large sums of money will be spent on the system both at Waterloo and Cedar Falls.

WEBB, IA.—The Webb Telephone Company, of Webb, Ia., has been incorporated with a capital stock of $10,000. Incorporators: U. D. Fisk and others.

MORROW, IND.—The Morrow Bethalto Telephone Company, Morrow, has been incorporated with a capital stock of $28,000. Incorporators: William Montgomery, C. E. Stahl and A. H. Smith.

TIPTON, KAN.—The Tipton Telephone Company, Tipton, Kan., has been incorporated with a capital stock of $3,500.

BARNARD, KAN.—The Farmers' Mutual Telephone Company has been incorporated with a capital of $2,500.

WAVERLY, KAN.—The Coffey County Telephone Company has been organized at Waverly with a capital stock of $16,000. H. A. White, president, general manager; C. H. McDuffie, vice-president; O. J. Rose, secretary and treasurer.

GRAND RAPIDS, MICH.—The Grand Rapids, Wood County, Mutual Telephone Company has been incorporated with a capital stock of $10,000. Incorporators: L. E. Carson, G. H. Clantz, E. A. Hall, John McLain, L. S. Abbott, A. W. Nafus and Herman Greaf.

HOLTON, MICH.—The Holton Rural Telephone Company, of Holton, has been incorporated with a capital stock of $5,000.

MILAN, MO.—The Milan Telephone Company has been incorporated with a capital stock of $2,000. Incorporators: J. C. Belshe, A. L. Belshe and others.

AMORY, MISS.—The Mississippi & Alabama Telephone Company has been organized with a capital stock of $10,000. Incorporators: J. C. Cheek, J. C. Burliner and others.

BOWDON, N. D.—The Farmers' Telephone Company has been formed. Officials: Loran Nichols, of Bowdon; John Wittmayer, of Goodrich, and A. C. Billings, of Bowdon.

CHICHESTER, N. H.—Articles of incorporation have been filed by the Chichester Telephone Company. Capital $3,000.

HAMMONTON, N. J.—The Hammonton Telephone & Telegraph Company has been incorporated with a capital stock of $125,000. Incorporators: A. J. Rider, S. Anderson, M. L. Jackson and others, all of Hammonton.

HOLLAND PATENT, N. Y.—The Oneida County Rural Telephone Company has been incorporated with a capital stock of $7,500. Central Exchanges at Stittvile and Holland Patent.

SOUTHPORT, N. Y.—The Southport Telephone Company, Southport, N. Y., has been incorporated with a capital stock of $2,500. Incorporators: Wisner J. Roy, W. G. Samburger, Southport, N. Y., and E. J. Joraleman, of Web Hills, N. Y.

SKANEATELES, N. Y.—The West Lakeside Telephone Company has been incorporated with a capital stock of $15,000. Incorporators: Charles Long, William Lockwood and A. Austin, all of Skaneateles, N. Y.

ROSE HILL, N. Y.—The Rose Hill Telephone Company has been incorporated with a capital stock of $5,000. The directors are: C. T. Easton, W. H. Ackles and F. Harvey, of Marietta; W. H. Sanders and G. E. Barler, of Spafford, and E. B. Cummings, of Rose Hill.

BARNEVELD, N. Y.—The Oneida County Rural Telephone Company has been incorporated with a capital of $7,500 to operate in Barneveld, South Trenton, Remsen, Prospect, etc. The Directors are E. D. Jones and J. D. Fuller, of Stillwell, and others.

LOWELL, O.—The Lowell Farmers' Telephone Exchange Company, Lowell, has been incorporated with a capital stock of $10,000. Incorporators: Jerry Swain, J. M. Merritt, C. Schimmel and others.

ROCK CREEK, O.—The Citizens' Telephone Company, of Rock Creek, has been incorporated with a capital stock of $4,800. Incorporators: W. Harrington, R. W. Covell, C. E. Andrus and others.

AGRA, OKLA.—The Cushing & Agra Rural Telephone Company of Agra has been incorporated with a capital stock of $3,000. Directors: E. T. Hensley, W. T. Gooch, F. H. Rheim and others.

IF THERE WERE no other way of connecting a wire to a dry battery, or to any piece of electrical apparatus, except by using the

FAHNESTOCK SPRING BINDING POST

we wouldn't have to tell you about it. You'd know.

But there is another way, and that's why we're talking. We want you to know about our way.

We want you to know that it does not cost any more to have Fahnestock Spring Binding Post on your dry batteries than the old style screw post.

We want you to specify them the next time you order.

Perhaps the man who does your ordering doesn't have to set the batteries up.

Perhaps he doesn't know how hard it is to connect up two batteries when they are in a telephone box and the wires are short.

But he ought to know how much it costs to send a man around there a month or two later when the wires have worked loose and he generally does know how mad the subscriber has been in the meantime. There's a remedy.

WRITE FOR SAMPLE. IT'S FREE.

Fahnestock Transmitter Co.

132 Havemeyer Street, Brooklyn, N. Y.

Cedar Poles
in stock

We have the following poles on our skids, ready for immediate shipment:

3,000—8" 25'
2,500—7" 30'
2,000—7" 35'
2,000—8" 30'
4,000—7" 40'
3,500—8" 40'
2,000—7" 45'
2,000—8" 45'
2,200—8" 50'
1,200—8" 55'
500—8" 60'
100—8" 65'
and longer.

Buy your poles direct from the producer and receive prompt shipment and satisfaction *always*. Wire for delivered prices at our expense.

The Lindsley Bros. Co.

Spokane, Wash. Portland, Ore. Chicago, Ill.

CARRIAGE and MACHINE BOLTS

We Galvanize by Hot Process.

Manufactured by

M. LANZ & SONS,

Pittsburg, Pa.

CHESTNUT POLES

J. I. M. WILSON COMPANY

Wholesale Producers

Bessemer Building PITTSBURG, PA.

POLES

20 and 25 foot lengths for rural telephone lines a specialty.

PORTER CEDAR CO., Saginaw, Mich.

WHITE CEDAR POLES

Buy from the Producers and Save Jobbers' Profits.

PENDLETON & GILKEY, - Minneapolis, Minn.

We Make a Specialty of Telephone Poles.

POLES

Large Stock

16 to 25 ft.
4 to 6 in. Tops

For Rural Lines

YARDS:
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Michigan White Cedar outlasts any wood. We make a specialty of Michigan Cedar. We also produce TIES and POSTS in large quantities.

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W. C. STERLING & SON CO.

Prevent Rot, and Double the Life of Poles, Crossarms and other woodwork by using

AVENARIUS CARBOLINEUM (*registered*), the only reliable, practical and economical preparation in its line.

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Carbolineum Wood Preserving Co., Milwaukee, Wis.

GEORGIA YELLOW PINE CROSS ARMS
LOCUST PINS J. S. BOGGS :: :: ALBANY GA.

MY CLAIMS: QUALITY, QUANTITY QUICK SHIPMENTS.

WRITE ME FOR ANYTHING YOU WANT IN THIS LINE

WAUSEON, O.—The Western Ohio Telephone Company, of Wauseon, has been incorporated with a capital stock of $10,000. Incorporators: J. T. Daniels, H. J. Brown and others, of Wauseon.

HARRAH, OKLA.—The Harrah Rural Telephone Company, of Harrah, has been incorporated with a capital stock of $5,000. Incorporators: Karl Haas and Marion E. Platt.

MORGANSVILLE, O.—The Morgansville Telephone Company, of Morgansville, has been incorporated with a capital stock of $5,000. Incorporators: Jackson James, W. J. Warne, J. E. Glass, H. F. Carter and others.

MT. STERLING, O.—The Home Telephone Company, Mt. Sterling, has been incorporated with a capital stock of $15,000. Incorporators: W. H. Alkire, G. M. Fisher and others.

SNYDER, OKLA.—The Snyder Telephone Company, of Snyder, Okla., has been incorporated with a capital stock of $5,000. Incorporators: J. Helen, J. H. Cormack, Fred Switzer and J. V. McClintic.

NEW CARLISLE, O.—The New Carlisle Telephone Company, of New Carlisle, has been incorporated with a capital stock of $25,000. Incorporators: C. D. Shelton and others.

LEVER, PA.—The Maple Creek Telegraph & Telephone Company has been incorporated with a capital stock of $5,000. Directors: C. A. Chalfant, A. B. Lutes, J. D. Duvall, I. N. Carson, Hiram Robinson, V. Van Robinson and N. T. Carson.

CAPE MAY, N. J.—The Citizens' Local Telephone Company has been organized with a capital stock of $12,000. President, Edward A. Well; vice-president, Reuben T. Johnson; secretary and general manager, Luther Ingersoll; treasurer, Hiram V. Soults.

PATRIOT, IND.—The Farmers' Mutual Telephone Company, of Patriot, has been incorporated with a capital stock of $5,000.

STOCKTON, KAN.—The Stockton & Ash Creek Telephone Company has been incorporated with a capital stock of $2,000.

MINNEAPOLIS, MINN.—The International Telephone Company has been incorporated, with a capital stock of $50,000, by members of the Backus-Brooks Lumber Company.

MESHOPPEN, PA.—The Meshoppen and Auburn Telephone Company, Meshoppen, has been incorporated with a capital stock of $5,000.

COLEBROOK, N. H.—The Coos County Telephone Company has been organized with the following officers: President, G. R. Magoon; secretary, J. T. Amey; treasurer, J. C. Hutchins.

LAWRENCEVILLE, VA.—The Brunswick Mutual Telephone Company has been incorporated with a capital stock of $25,000.

MONONGAHELA, PA.—The Monongahela Telephone Company has been incorporated with a capital stock of $30,000.

ERMA, N. J.—The Citizens' Local Telephone Company, Erma, has been incorporated with a capital stock of $10,000. Incorporators: E. A. Wells, H. V. Sonets and Luther Ingersoll.

DOVER, N. Y.—The Dover Telephone Company has been incorporated with a capital stock of $400. The directors are as follows: Sanford Hoag, Pawling; Fred Coleman, Wing Station; Charles Hoag, Pawling, and others.

NEW KINGSTON, N. Y.—The New Kingston Telephone Company, of New Kingston, has been incorporated with a capital stock of $500. Incorporators: W. T. Faulkner, E. D. O'Connor, J. R. Archibald and others, of New Kingston.

ORLANDO, OKLA.—The Fairview Telephone Company has been incorporated with a capital stock of $540. William D. Gish, Robert Grant and John L. Winkler, of Orlando, incorporators.

LAWRENCEVILLE, VA.—The Brunswick Mutual Telephone Company, of Lawrenceville, Va., has been incorporated, with a capital stock of $25,000. Incorporators: L. H. Raney, president; E. I. Spatig, vice-president; F. W. Davie, secretary and treasurer, all of Lawrenceville.

SCOTTSBURG, VA.—The Scottsburg-Houston Telephone Company has been organized, with J. T. Lacy for president, and R. A. Walden, secretary.

PERSONAL.

C. P. Wainman, formerly general manager of the Northwestern Telephone Company, of Minneapolis, Minn., has been elected vice-president. He has also been elected vice-president of the Duluth Telephone Company, and vice-president and director of the Mesaba Telephone Company.

F. W. WHEELER, of Oxford, Neb., has accepted the position of manager of the Grand Island Telephone Company, recently made vacant by the resignation of Mr. F. J. Butterfield.

G. C. CARPENTER, of Findlay, Ohio, who has been associated with the Central Union Telephone Company for the last ten years, has been appointed local manager at Jacksonville, Ill.

J. E. FARNSWORTH, general manager of the Southwestern Telegraph & Telephone Company, of Dallas, Tex., has been elected vice-president of that company.

HORACE ELLET has succeeded Mr. C. E. Jones as president of the Fluvanna Telephone Company of Palmyra, Va. Mr. Jones remains with the company as general manager.

New Construction in the Field

AMELIA, VA.—The Virginia Telephone Company expects shortly to extend its line in the direction of Mannboro and Blackstone.

FULLERTON, CAL.—The Home Telephone Company is extending its line from Whittier through La Habra Valley.

LERNA, ILL.—The Lerna Mutual Telephone Company is building a line from Lerna to Janesville.

KLONDIKE, ILL.—The Osceola Exchange of the Home Telephone Company of Klondike will shortly be installed.

STERLING, ILL.—The Interstate Telephone Company is to spend between $6,000 and $7,000 in improving its system.

CLINTON, ILL.—The National Telephone & Electric Company is planning to build a line from Clinton to Atlanta.

MADISON, IND.—The Madison Telephone Company is to install 300 new telephones.

EVANSVILLE, IND.—The Excelsior, Harrison County and Mutual Independent Telephone Company will establish a branch exchange at Crandall, Ind.

EVANSVILLE, IND.—The Knox County Home Telephone Company will build a branch line to Beall, Ind.

OWINGSVILLE, KY.—The Sparksburg Home Telephone Company is to build a line from Owingsville to Olympia Springs.

WEST UNION, MINN.—A new telephone line is to be built by H. Severson, of Gordon.

SLEEPY EYE, MINN.—The Sleepy Eye Telephone Company is to build 60 miles of lines out of the city in all directions.

SCHENECTADY, N. Y.—The Home Telephone Company is to extend its lines from Schenectady to Rexford Flats.

NEW LISBON, N. Y.—The New Lisbon Farm Telephone Company has voted to increase its stock, and expects to extend its lines.

SHAWNEE, OKLA.—The Pioneer Telephone Company is to install an entire new telephone system.

GALETON, PA.—The Galeton & Hull Telephone Company is to construct a line from Galeton to Hammersly. J. S. Hull, president; W. D. Cool, vice-president.

ORIENT, S. D.—A new telephone line is to be built from Orient to Miller. The promoter of the line is J. H. Hayes, of Faulkton.

CAMERON, W. VA.—The Cameron Telephone Company is to build a line to Moundsville.

NAPLES, N. Y.—The Ontario & Steuben County Telephone Company is to extend its system, having increased its capital stock to $30,000 for this purpose.

MEDINA, TENN.—The Horn Telephone Company is to build a line from Jackson to Medina.

CHILLICOTHE, MO.—The Chillicothe Telephone Company is to build a line from Hale to Chillicothe.

HUMBOLDT, NEB.—The City Mutual Telephone Company is to practically rebuild its system, putting in new switchboard, cables, poles, lines, etc.

PINE HILL, N. Y.—The Citizens' Stamford Telephone Company is to spend about $200,000 in extending and improving its system.

SAN FRANCISCO, CAL.—The Home Telephone Company, of San Francisco, will build a line from San Francisco to Portland.

EUSTIS, FLA.—The Eustis Telephone Company is to build a line to Mount Dora.

BOISE, IDAHO.—The Independent Telephone Company is to build a new exchange building, and enlarge its system.

WHITEHALL, ILL.—The Illinois Telephone Company is extending its country lines.

CRANDALL, IND.—The Excelsior, Harrison County & Mutual Telephone Companies will install a new and up-to-date exchange in Crandall.

MONDAK, MONT.—The Great Northern Telephone Company is to build a line from Mondak to Minot. It will also establish an exchange at Culbertson.

LAWRENCE, O.—The Lawrence Telephone Company is to establish connections with Getaway.

OGDEN, UTAH.—The Utah Independent Telephone Company is to extend its lines into the Ogden Canyon.

PORT ANGELES, WASH.—The Port Angeles Telephone Company is to build a line from Port Angeles to Dungeness.

BUCHANAN, MICHIGAN, EXCHANGE OPERATED BY OLD TIME MANAGER.

MANAGER MORRIS, of the Buchanan, Michigan, Telephone Company, has added 150 subscribers to the exchange during the past year. Many of them are farmers. Rural lines now extend over a radius of 15 miles from Buchanan, and give a service second to none in the State. Mr. Morris has been manager of the Buchanan exchange since the first telephone was put in the town, in 1881, and in point of years' service, is the oldest manager in Southwestern Michigan.

A Great Electrical Supply House

THE rapid growth of electric industries, notably those which have been keeping pace with the enormous expansion in telephonic communication, is well illustrated in the career of the well-known Electric Appliance Company of Chicago. This concern, which started fifteen years ago in a single room, is to-day rated as one of the largest of its kind in the world and is now occupying an immense new building especially constructed for the needs of its rapidly increasing business. A growth like this shows in concrete form what has been taking place in telephonic and kindred industries during the past decade.

Fifteen years ago Mr. Willard W. Low and Mr. Thomas I. Stacey, the president and secretary of the company, decided that there was room for an electrical supply house, whose policy should be, prompt and complete shipments, and uniform prices. The splendid new quarters into which the Electric Appliance Company recently moved are a fitting monument to the judgment of these men, as well as to the thoroughness with which they have kept faith with the purchasing public. At that time the number of articles handled in an electrical supply business was not more than ten per cent as great as to-day, and one floor at 242 Madison street was large enough for the young business. But not for long. Soon it became necessary to take in the basement, and a year later the two upper floors were added.

About ten years ago when the Independent telephone movement first started, the company established a telephone department with Mr. S. A. Dinsmore in charge. Ample space was given Mr. Dinsmore for a shop and the "Eaco" Series Telephone was placed upon the market. The growth of the concern then became phenomenal. During the first year thereafter the company installed many complete telephone exchanges, among them being Hoopston and Paxton, Ill.; Muncie, Ind., and Ottawa, Kan. The five hundred drop board at Muncie was operated several years by the Independent company, and after the sale to the Bell people it was still operated two years. Upon the exchange being rebuilt, this board was added to the equipment at Ottawa, Kan., and is still in operation.

Six years ago it was found necessary, in order to handle the increasing business, to engage larger quarters. A double five-story building at the corner of Van Buren and Jefferson streets was secured. This was ample for about two years; then warehouse No. 2 was established at 165 South Canal street for the accommodation of cross arms, insulators, electro galvanized conduit and other heavy and bulky material. This arrangement proved very satisfactory for a time, but soon the business outgrew it. There seemed danger that the company would lose its reputation for making prompt shipments on account of being so crowded, and it was therefore decided that new quarters giving double the floor space would have to be secured.

Willard W. Low, President.

Thomas I. Stacey, Secretary and Treasurer.

Last summer the architects for the company were given instructions as to what was required in order to make a model supply house, one that would not only accommodate the present large volume of business, but would allow for future growth. The result may be seen in the new building 134-136-138-140 West Jackson Boulevard, at the intersection of Desplaines street. This building is a six story and basement structure with a frontage of 100 feet on Jackson and nearly as much on Desplaines, which gives the company about 65,000 square feet of floor space. This is ample for the present needs of the business. The roof is a temporary affair, it being the intention to add two more stories when the business warrants it.

The building is mill constructed and as nearly fireproof as possible. Special attention has been paid to maintaining the traditional policy of prompt shipments. Two large freight elevators, one with a capacity of 3,000 and the other 4,000 pounds, connect each floor. In addition there is a smaller "dummy" for convenience in assembling parts and handling the smaller stuff. An intercommunicating telephone system, the "Eaco," of course, has been installed with service in each room. Each department, furthermore, has a long distance telephone service through a branch exchange. The building is heated with steam throughout and well lighted with some 700 incandescent electric lamps.

A trip through the building impresses the visitor with the

P. R. Boole, General Sales Manager.

S. A. Dinsmore, Mgr. Tel. Dept.

neatness and orderliness which obtains throughout, as well as with the special facilities for handling orders without delay. The basement is large and well lighted. Two chutes connect it with the street above. Here are stored a large assortment of supplies, including the largest stock of weather proof wire to be found west of the Alleghanies. Roebling's galvanized telephone wire, Paranite telephone cables, "O. K." interior telephone wires, glass insulators, cross-arm braces, pole steps, etc., are carried in great quantities.

The receiving department and city sales department occupy the first floor, and here also are stored such heavy material as cross arms, electro-galvanized conduit, etc. The city sales department is in charge of Mr. S. A. Rale, who has represented the company during the past ten years in the city of Chicago. A special system has been installed to enable the company to handle the city business with the greatest possible rapidity. This department carries its own large and carefully assorted stock ready for immediate delivery on city orders.

B. J. Wallingford, Mgr. of Stock and Shipping Dept.

Ephraim Behrend, Mgr. of Receiving Dept.

W. P. Upham, in Charge of Order Dept.

J. W. Neil, Chief of Aud't Dept.

S. A. Rale, in Charge of City Sales Dept.

The receiving department is in charge of Mr. Ephraim Behrend. After the goods are packed and ready for shipment they are turned over to this department. Special provision was made in the construction of the new building so that a considerable number of wagons can be loaded at once. The advantage of this is obvious, especially as the building is in close proximity to all of the freight depots. This department receives all of the material that comes into the house either for stock or orders, and experienced men inspect everything closely, so that there is no possibility of a customer receiving material not up to the standard.

The general offices of the company occupy the entire second floor, one-half being given to the sales department and the other half to the auditing department. Special provision has been made for the comfort of out of town customers. Sixty people are employed in these offices and one hundred and twenty-five in the entire building. There are fireproof vaults, telephone switchboard, etc., on this floor.

The third floor is occupied by the telephone branch of the business. Here is the manufacturing department where the famous Eaco series and bridging telephones and the Eaco inter-communicating telephones are made. The shop is equipped with all the necessary machinery and is well lighted and commodious. A large stock of telephone parts is carried on this floor, which is in charge of Mr. S. A. Dinsmore, who first took hold of the department ten years ago. The floor is also known as the assembly floor. All the orders from the different floors are assembled here prior to shipment. A portion of the floor is used as an office for freight receipts and for a city "pick-up" department to fill out incomplete orders.

The remainder of the building is given over to the large stock carried by the company. Each floor has a stock man, with two assistants, who keep up the stock and get out orders. There is a lavatory on each floor, also a water tank used in connection with self-filling buckets and an automatic fire alarm system. Kilfyre fire extinguishers throughout the building give added protection.

Mr. P. R. Boole is general sales manager. He has been with the company for the past twelve years in various capacities, including five years experience on the road. Prior to going with the company he was connected with several electrical manufacturing concerns. All advertising, making quotations, compiling catalogues and entering orders is done by this department. The twenty-five people employed under Mr. Boole are kept busy handling this branch of the business.

One of the most important things in handling a customer's order is to see that it is correctly entered on the shipping blanks. The order department in a concern as large as the Electric Appliance Company must be maintained at the highest degree of excellence. Mr. W. P. Upham, who is in charge of this department, has been with the company during the past eight years. A part of the time he represented the house in the State of Michigan and the remainder he has spent in the office. Before coming to the company he was for a number of years with the Thompson-Houston Electric Company. The greatest possible accuracy in this department is secured by the personal attention of Mr. Upham. He also oversees all quotations, both on general supplies and on the electric light specialties that the company handles.

Mr. J. W. Neil is in charge of the auditing department. He has been with the company eight years and has seen the department grow from a small beginning until it now takes thirty assistants to handle the work properly and promptly.

Besides the Chicago warehouse the company has a branch office in San Francisco in charge of Mr. C. C. Hillis, who is ably assisted by Mr. F. J. Cram. In closing it may be interesting to many to know that the heads of the various departments meet each week for a conference, at which ways and means are discussed for improving the conduct of the business.

Electric Appliance Company's

New Building

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Chicago

* * *

America's Largest Electrical Supply Warehouse

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General Electric Securities Co.,

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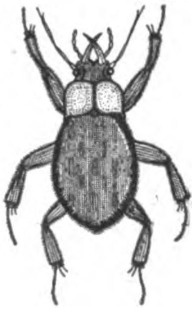

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Creosoted Poles and Cross Arms

are Bug Proof, Water Proof and Dry Rot Proof. They cannot decay or break, and last indefinitely.

The trifling greater first cost is saved many times in the longer life gained by the treatment. We sell them and will quote prices gladly. Write for our booklet.

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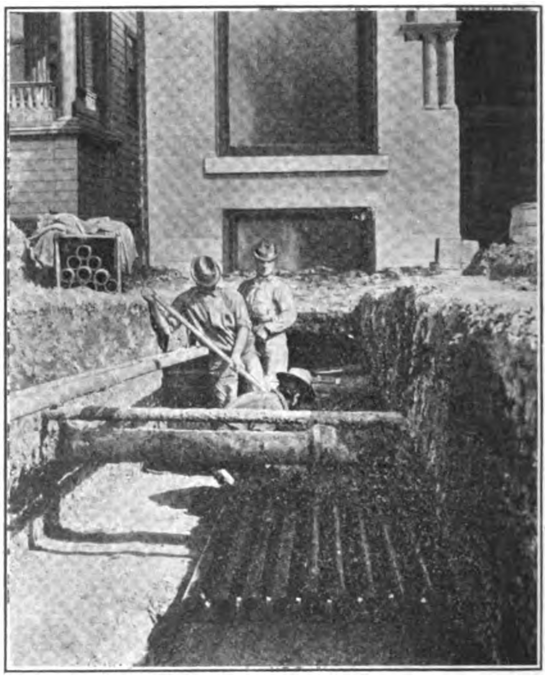

The American Conduit Company has a corps of experts in underground construction and is prepared to furnish supervision of work if desired. We would prefer to co-operate with contractors in underground construction, but if desired will submit estimates and bids and take contracts for completed underground systems in any part of the United States or Canada.

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Expert Electrical Subway Contractor

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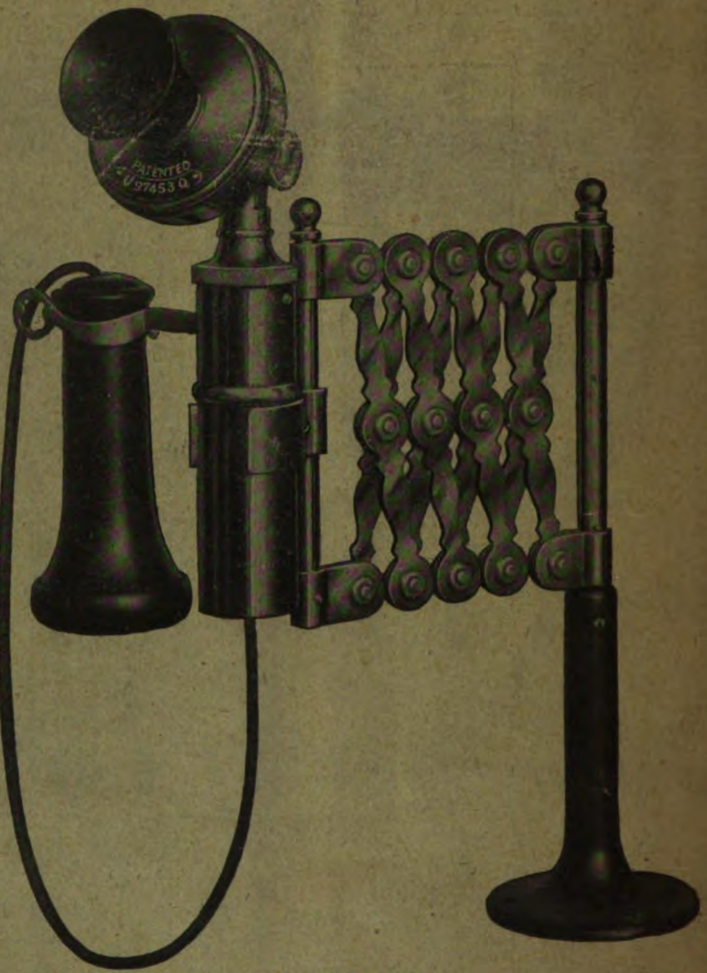

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Made either for roll or flat top desks or for mounting on the wall.

Brackets are made any desired length.

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